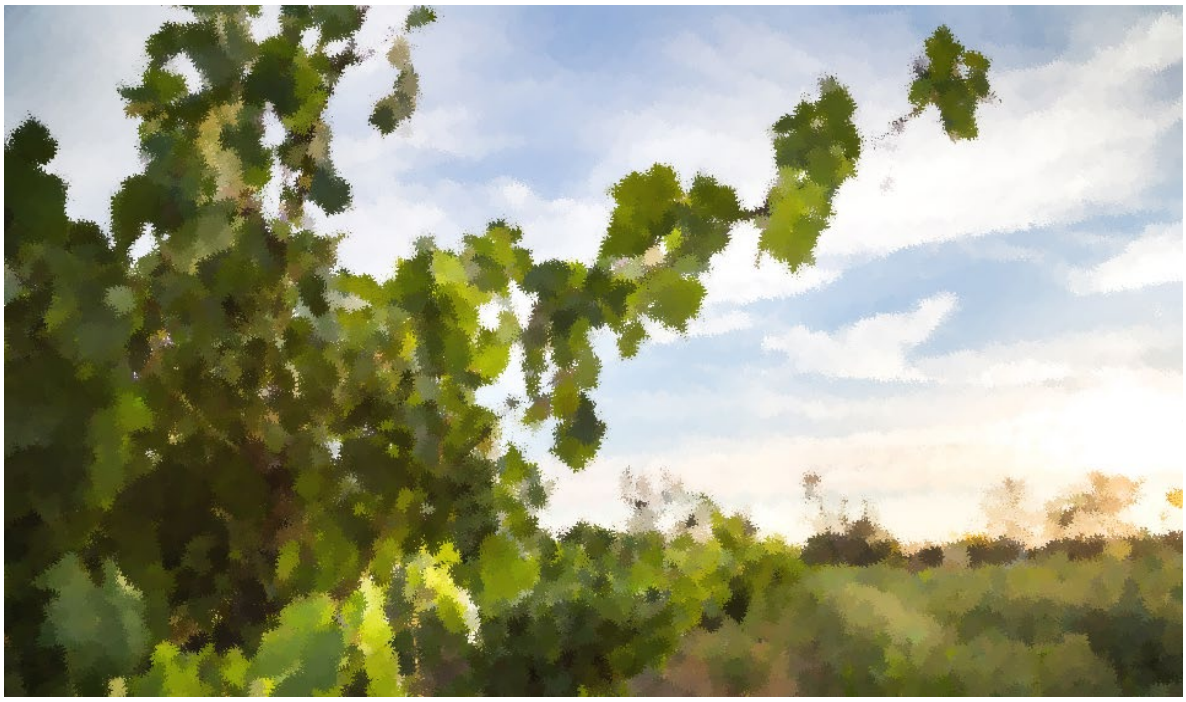


2022 Regional Transportation Plan & Sustainable Communities Strategy

Draft Programmatic Environmental Impact Report
SCH # 2020120482

prepared by

San Joaquin Council of Governments
555 East Weber Avenue
Stockton, California 95202
Contact: Timothy Kohaya, Senior Regional Planner

prepared with the assistance of

Rincon Consultants, Inc.
7080 North Whitney Avenue, Suite 101
Fresno, California 93720

June 2022

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
rinconconsultants.com

2022 Regional Transportation Plan & Sustainable Communities Strategy

Draft Programmatic Environmental Impact Report
SCH # 2020120482

prepared by

San Joaquin Council of Governments
555 East Weber Avenue
Stockton, California 95202
Contact: Timothy Kohaya, Senior Regional Planner

prepared with the assistance of

Rincon Consultants, Inc.
7080 North Whitney Avenue, Suite 101
Fresno, California 93720

June 2022

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
rinconconsultants.com

This report prepared on 50% recycled paper with 50% post-consumer content.

Table of Contents

Tables

Figures

Appendices

Executive Summary

This document is an Environmental Impact Report (EIR) analyzing the environmental effects of the proposed 2022 Regional Transportation Plan & Sustainable Communities Strategy (proposed 2022 RTP SCS). This section summarizes the characteristics of the proposed project, alternatives to the proposed project, and the environmental impacts and mitigation measures associated with the proposed project.

Lead Agency Contact Person

Timothy Kohaya, Senior Regional Planner
San Joaquin Council of Governments
555 East Weber Avenue
Stockton, California 95202
209-235-0389

Project Description

This EIR has been prepared to examine the potential environmental effects of the proposed 2022 Regional Transportation Plan & Sustainable Communities Strategy (hereafter referred to as the proposed 2022 RTP/SCS). The following is a summary of the full project description, which can be found in Chapter 2, *Project Description*.

The proposed 2022 RTP/SCS covers the entire area of San Joaquin County and includes all the incorporated cities and unincorporated communities contained therein. Refer to Figure 2-1 in Chapter 2, *Project Description,* for a map of the project location. Capital improvement projects identified in the proposed 2022 RTP/SCS are located on State highways, county roads and locally owned streets, as well as on transit district property and public utility lands.

Project Objectives

The purpose of the proposed 2022 RTP/SCS is to coordinate and facilitate the programming and budgeting of all transportation facilities and services within the SJCOG region through the year 2046 and demonstrate how the region will integrate transportation and land use planning to meet the greenhouse gas emissions reduction targets established by the California Air Resources Board and in accordance with other State and Federal regulations. It identifies reasonably available sources of funding for transportation. The proposed 2022 RTP/SCS is a plan for improving the quality of life for residents of the SJCOG region by planning for wise transportation investments and informed land use choices. The Plan achieves its overall objectives by combining transportation investment policies with integrated land use strategies that reduce greenhouse gas (GHG) emissions. The project objectives are as follows:

- Enhance the Environment for Existing and Future Generations and Conserve Energy;
- Maximize Mobility and Accessibility;
- Increase Safety and Security;
- Preserve the Efficiency of the Existing Transportation System;
- Support Economic Vitality;

- Promote Interagency Coordination and Public Participation for Transportation Decision-Making and Planning Efforts;
- Maximize Cost-Effectiveness; and
- Improve the Quality of Life for Residents.

Project Characteristics

The RTP/SCS is based on a preferred land use and transportation scenario which lays out a pattern of future growth and transportation system investment for the region emphasizing a transit-oriented development and an urban infill approach to land use and housing. Accordingly, population and employment growth is allocated principally within existing urban areas near public transit. Allocation of future growth directly addresses jobs-housing balance issues.

The preferred scenario consists of an intensified land use distribution approach that concentrates the forecasted population and employment growth in existing urban areas along centers and corridors. This focus intends to minimize impacts on rural areas which contain the majority of agricultural land throughout the County. The transportation network includes additional highway, local street, active transportation, and transit investments to serve a more concentrated urban growth pattern. The preferred scenario also shifts investment towards bicycle and pedestrian improvements that complement public transit and other non-vehicle alternatives.

SJCOG, in developing scenario strategies, identified emerging trends that SJCOG as a regional planning agency could influence. The trends are transportation technology (particularly driverless vehicles), impacts from extreme weather events due to changes in climate, and the increase in teleworking and internet shopping (the e-economy). Three futures with assumptions about land use and transportation in the year 2046 were then prepared with each future dominated by one of the three emerging trends. These futures were used to prepare the alternative scenarios or packages of assumptions for testing.

The plan identifies transportation system needs consistent with the preferred scenario and includes comprehensive lists of programmed and planned transportation investments that are intended to meet performance goals for mobility, safety, congestion relief, system preservation and environmental protection. In addition to its other components, the preferred scenario also includes an enhanced transit strategy that creates a framework for future transit service expansion at such time as new revenue sources become available. Recognizing the uncertain nature of future new revenue sources, it takes a targeted, balanced and flexible approach to expanding transit service as needed in the future. The enhanced transit strategy commits to transit service expansion as new revenue sources become available, (1) identifying when transit enhancements are actually needed through quantitative triggers, and (2) protecting existing funding for competing local demands, such as street and road maintenance. The enhanced transit strategy is a strategy for the future. It does not change the list of fiscally constrained, programmed and planned transportation projects.

The plan includes an executive summary and nine chapters:

0. **Executive Summary.** Includes an overview of 2022 RTP/SCS, the preferred scenario and its performance, an explanation of the planning process, and the allocation of transportation funding.
1. **Creating a Sustainable Communities Strategy.** Discusses the region's geographic and regulatory setting and provides projects on county population, housing, and employment. This chapter sketches the region's transportation system and economic assets, including goods movement by

roads, water, air, and rail. It also contains an overview of how the RTP/SCS will achieve sustainability goals through regional collaborations for regional solutions.

2. **Civic Engagement**. Describes the extent of work and effort invested in civic engagement throughout San Joaquin County to shape the proposed 2022 RTP/SCS.
3. **The Building Blocks.** Provides information on policies contained within the proposed 2022 RTP/SCS
4. **Financing the Transportation System.** Describes how 2022 RTP/SCS allocates and applies existing and new sources of revenue, and fiscal constraints.
5. **Performance of the Sustainable Communities Strategy.** Describes the performance of the SCS in comparison to the 2018 RTP/SCS.
6. **Economic Vitality.** Discusses the role of transportation in achieving economic vitality in San Joaquin County, including roadways, public transportation, railways, airports, and a port.
7. **Innovations and Technology.** Discusses technological trends and ways SJCOG is moving to meet technology challenges for the SJCOG region.
8. **Housing.** Describes the current state of housing in the SJCOG region and the effects of housing costs on the SJCOG region's residents. It also evaluates proposed 2022 RTP/SCS strategies to support local agencies in increasing housing production.
9. **Framework for Moving Forward.** Identifies foreseen challenges and opportunities to future development and discusses the effects of implementation of the proposed 2022 RTP/SCS.

Alternatives

As required by the California Environmental Quality Act (CEQA), this EIR examines alternatives to the proposed project. Studied alternatives include the following two alternatives. Based on the alternatives analysis, Alternative 2 was determined to be the environmentally superior alternative.

- **Alternative 1: No Project Alternative** (SCS Scenario A: Stay the Course). In this scenario, the region does not change course and makes investments based on the last regional plan. Growth occurs primarily in new growth areas identified in the region's General or Specific Plans. The prioritized land use strategies include the following:
  - Prioritize projects that make more efficient use of existing road network
  - Prioritize large employer recruitment
  - Improve access to safe and convenient walking and biking options
  - Prioritize projects that improve and expand access to public transit

  Transportation investments are focused on managed lanes, ACE Rail, enhanced bus rapid transit. The prioritized transportation strategies include the following:

  - Only transportation projects included in the 2018 RTP would be constructed (excludes projects listed in Table 6-1 in the Chapter 6, *Alternatives*)
  - Prioritize expanding the roadway network
- **Alternative 2: Remake Centers and Corridors** (SCS Scenario B: Remake Centers and Corridors). Traditional employment centers and aging commercial corridors are remade into residentially-focused neighborhoods. Growth is focused on urban arterials, existing neighborhoods, and job centers. The prioritized land use strategies include the following:
  - Encourage infill development

- Promote a broader range of housing types
- Develop a regional trust fund dedicated to addressing housing issues

Transportation focus investments in transit and bike/ped for infill locations along existing arterials, improvements/maintenance to local arterials to facilitate new types of development. The prioritized land use strategies include the following:

- Prioritize "complete streets" projects throughout the region
- Greater prioritization on projects that improve and expand access to public transit

Chapter 6 of the EIR describes these alternatives in further detail and compares their impacts to the proposed 2022 RTP/SCS's impacts. The alternatives are also compared to each other as well as the proposed project, and Chapter 6 provides an environmentally superior CEQA analysis.

Areas of Known Controversy

The EIR scoping process identified few areas of known controversy for the proposed project. Responses to the Notice of Preparation of a Draft EIR and input received are summarized in Table 1-1 of Chapter 1, *Introduction*.

Issues to be Resolved

Issues to be resolved include the choice among alternatives, and the nature of mitigation measures to be adopted.

Summary of Impacts and Mitigation Measures

Table ES-1 summarizes the direct environmental impacts of the proposed project, proposed mitigation measures, and residual impacts (the impact after application of mitigation, if required). Impacts are categorized as follows:

- **Significant and Unavoidable.** An impact that cannot be reduced to below the threshold level given feasible mitigation measures. Such an impact requires a Statement of Overriding Considerations to be adopted if the proposed project is approved per §15093 of the *State CEQA Guidelines*.
- **Less than Significant with Mitigation Incorporated.** An impact that can be reduced to below the threshold level given feasible mitigation measures.
- **Less than Significant.** An impact that may be adverse but does not exceed the threshold levels and does not require mitigation measures.
- **No Impact:** The proposed project would have no effect on environmental conditions or would reduce existing environmental problems or hazards.

Cumulative impacts of the proposed 2022 RTP/SCS are not summarized Table ES-1. They are evaluated in each resource section of the EIR in Chapter 4.

Table ES-1 Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts

Impact	Mitigation Measure(s)	Impact Finding
Aesthetic and Visual Resources		
Impact AES-1. The proposed transportation projects and land use projects envisioned under the proposed 2022 RTP/SCS would have a substantial adverse effect on scenic vistas and substantially damage scenic resources within a state scenic highway. Impacts would be significant and unavoidable.	**AES-1(a) Tree Protection and Replacement.** The implementing agency for new roadways, extensions and widenings of existing roadways, trails and facility improvement projects shall, or can and should, avoid the removal of existing mature trees to the extent possible consistent with adopted local City and County policies as applicable. The implementing agency of a particular proposed 2022 RTP/SCS project shall replace any trees lost at a minimum 2:1 basis and incorporate them into the landscaping design for the roadway when feasible, or as required by local or County requirements. The implementing agency also shall ensure the continued vitality of replaced trees through periodic maintenance. **AES-1(b) Discouragement of Architectural Features that Block Scenic Views.** The implementing agency shall, or can and should, design projects to minimize contrasts in scale and massing between the project and surrounding natural forms and development. Setbacks and acoustical design of adjacent structures shall be preferentially used as mitigation for potential noise impacts arising from increased traffic volumes associated with adjacent land development. The use of sound walls, or any other architectural features that could block views from the scenic highways or other view corridors, shall be discouraged to the extent possible. Where use of sound walls is found to be necessary, walls shall incorporate offsets, accents, and landscaping to prevent monotony. In addition, sound walls shall be complementary in color and texture to surrounding natural features.	Significant and Unavoidable
Impact AES-2. The proposed transportation projects and land use patterns envisioned by the proposed 2022 RTP/SCS would in non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site or its surroundings, and in an urbanized area, would conflict with applicable zoning and other regulations governing scenic quality. Impacts would be significant and unavoidable.	**AES-2 Design Measures for Visual Compatibility.** The implementing agency shall, or can and should, require measures that minimize contrasts in scale and massing between the project and surrounding natural forms and developments. Strategies to achieve this include: ▪ Siting or designing projects to minimize their intrusion into important viewsheds; ▪ Avoiding large cuts and fills when the visual environment (natural or urban) would be substantially disrupted; ▪ Ensuring that re-contouring provides a smooth and gradual transition between modified landforms and existing grade; ▪ Developing transportation systems to be compatible with the surrounding environments (e.g., colors and materials of construction material; scale of improvements); ▪ Designing and installing landscaping to add natural elements and visual interest to soften hard edges, as well as to restore natural features along corridors where possible after widening, interchange modifications, re-alignment, or construction of ancillary facilities; and ▪ Designing new structures to be compatible in scale, mass, character, and architecture with existing structures.	Significant and Unavoidable

Impact	Mitigation Measure(s)	Impact Finding
Impact AES-3. Development of proposed transportation improvement projects and land use patterns envisioned under proposed 2022 RTP/SCS would create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area. Impacts are significant and unavoidable.	**AES-3(a) Roadway and Project Lighting.** Implementing agencies shall, or can and should, minimize roadway lighting to the extent possible, consistent with safety and security objectives, and shall not exceed the minimum height requirements of the local jurisdiction in which the project is proposed. This may be accomplished through the use of back shields, hoods, low intensity lighting, and using as few lights as necessary to achieve the goals of the project. **AES-3(b) Lighting Design Measures.** As part of planning, design, and engineering for projects, project sponsors shall, or can and should, ensure that projects proposed near light-sensitive uses avoid substantial spillover lighting. Potential design measures include, but are not limited to, the following: ▪ Lighting shall consist of cutoff-type fixtures that cast low-angle illumination to minimize incidental spillover of light into adjacent properties and undeveloped open space. Fixtures that project light upward or horizontally shall not be used. ▪ Lighting shall be directed away from habitat and open space areas adjacent to the project site. ▪ Light mountings shall be downcast, and the height of the poles minimized to reduce potential for backscatter into the nighttime sky and incidental spillover of light onto adjacent private properties and undeveloped open space. Light poles will be 20 feet high or shorter. Luminary mountings shall have non-glare finishes. ▪ Exterior lighting features shall be directed downward and shielded in order to confine light to the boundaries of the subject project. Where more intense lighting is necessary for safety purposes, the design shall include landscaping to block light from sensitive land uses, such as residences. **AES-3(c) Glare Reduction Measures.** Implementing agencies shall, or can and should, minimize and control glare from transportation and land use projects near glare-sensitive uses through the adoption of project design features such as: ▪ Planting trees along transportation corridors to reduce glare from the sun; ▪ Creating tree wells in existing sidewalks; ▪ Adding trees in new curb extensions and traffic circles; ▪ Adding trees to public parks and greenways; ▪ Landscaping off-street parking areas, loading areas, and service areas; ▪ Limiting the use of reflective materials, such as metal; ▪ Using non-reflective material, such as paint, vegetative screening, matte finish coatings, and masonry; ▪ Screening parking areas by using vegetation or trees; ▪ Using low-reflective glass; ▪ Complying with applicable general plan policies, municipal code regulations, city or local controls related to glare; and ▪ Tree species planted to comply with this measure shall provide substantial shade cover when mature. Utilities shall be installed underground along these routes wherever feasible to allow trees to grow and provide shade without need for severe pruning.	Significant and Unavoidable

Impact	Mitigation Measure(s)	Impact Finding
Air Quality		
Impact AQ-1. The proposed 2022 RTP/SCS would not conflict with or obstruct implementation of the applicable air quality plan. Impacts would be less than significant.	None required.	Less than Significant
Impact AQ-2. Construction activities associated with transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would result in a cumulatively considerable net increase in criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard. This impact would be significant and unavoidable.	**AQ-2(a) Application of SJVAPCD Feasible Mitigation Measures.** For all projects, the implementing agency shall incorporate the most recent SJVAPCD feasible construction mitigation measures and/or technologies for reducing inhalable particles based on analysis of individual sites and project circumstances. Additional and/or modified measures may be adopted by SJVAPCD prior to implementation of individual projects under the proposed 2022 RTP/SCS; therefore, the most current list of feasible mitigation measures at the time of project implementation shall be used. The current SJVAPCD feasible mitigation measures include the following (SJVAPCD 2015b): ▪ All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, tarp cover, or other suitable cover or vegetative ground cover. ▪ All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking. ▪ When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained. ▪ Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant. ▪ An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles shall implement measures to prevent carryout and trackout. ▪ Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use. **AQ-2(b) Diesel Equipment Emissions Standards.** The implementing agency shall ensure, to the maximum extent feasible, that diesel construction equipment meeting CARB Tier 4 emission standards for off-road heavy-duty diesel engines is used. If use of Tier 4 equipment is not feasible, diesel construction equipment meeting Tier 3 (or if infeasible, Tier 2) emission standards shall be used. These measures shall be noted on all construction plans, and the implementing agency shall perform periodic site inspections. **AQ-2(c) Electric Construction Equipment.** The implementing agency shall ensure that to the extent feasible, construction equipment utilizes electricity from power poles rather than temporary diesel power generators and/or gasoline power generators.	Significant and Unavoidable

Impact	Mitigation Measure(s)	Impact Finding
Impact AQ-3. Operation of the proposed transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would result in a cumulatively considerable net increase of a criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. Impacts would be significant and unavoidable.	**AQ-3 Long-term Regional Operational Emissions.** Implementing agencies can and should implement long-term operational emissions reduction measures. Such reduction measures include the following: ▪ Require that all interior and exterior architectural coatings for all developments utilize coatings following SJVAPCD Rule 4601, *Architectural Coatings*. ▪ Increase building envelope energy efficiency standards in excess of applicable building standards and encourage new development to achieve zero net energy use. ▪ Install energy-efficient appliances, interior lighting, and building mechanical systems. Encourage installation of solar panels for new residential and commercial development. ▪ Locate sensitive receptors more than 500 feet of a freeway, 500 feet of urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day. ▪ Locate sensitive receptors more than 1,000 feet of a major diesel rail service or railyards. Where adequate buffer cannot be implemented, implement the following: ▫ Install air filtration (as part of mechanical ventilation systems or stand-alone air cleaners) to indoor reduce pollution exposure for residents and other sensitive populations in buildings that are close to transportation network improvement projects. ▫ Use air filtration devices rated MERV-13 or higher. ▪ Plant trees and/or vegetation suited to trapping roadway air pollution and/or sound walls between sensitive receptors and the pollution source. The vegetation buffer should be thick, with full coverage from the ground to the top of the canopy Install higher efficacy public street and exterior lighting. ▪ Use daylight as an integral part of lighting systems in buildings. ▪ Use passive solar designs to take advantage of solar heating and natural cooling. ▪ Install light colored “cool” roofs, cool pavements. ▪ Install solar and tankless hot water heaters. ▪ Exclude wood-burning fireplaces and stoves. ▪ Incorporate design measures and infrastructure that promotes safe and efficient use of alternative modes of transportation (e.g., neighborhood electric vehicles, bicycles) pedestrian access, and public transportation use. Such measures may include incorporation of electric vehicle charging stations, bike lanes, bicycle-friendly intersections, and bicycle parking and storage facilities. ▪ Incorporate design measures that promote ride sharing programs (e.g., by designating a certain percentage of parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading and waiting areas for ride sharing vehicles, and providing a web site or message board for coordinating rides).	Significant and Unavoidable
Impact AQ-4. The proposed transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would expose sensitive receptors to substantial particulate matter	None required.	Less than Significant

Impact	Mitigation Measure(s)	Impact Finding
pollutant concentrations. However, because the proposed 2022 RTP/SCS would reduce exposure in comparison to baseline conditions, Impacts would be less than significant.		
Impact AQ-5. The transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would expose sensitive receptors to substantial TAC concentrations. Impacts would be significant and unavoidable.	**AQ-4 Health Risk Reduction Measures.** Transportation project sponsor agencies shall implement the following measures for projects that could facilitate an increase in vehicle trips: ▪ During project-specific design and CEQA review, the potential localized particulate (PM_{10} and $PM_{2.5}$) impacts and their health risks shall be evaluated for individual projects. Localized particulate matter concentrations shall be estimated using procedures and guidelines consistent with U.S. EPA 2015's *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*. If required based on the project-level hotspot analysis, project-specific mitigation shall be added to the project design concept or scope to ensure that local particulate (PM_{10} and $PM_{2.5}$) emissions would not reach a concentration at any location that would cause estimated cancer risk to exceed the SJVAPCD threshold of 20 in one million. Per the U.S. EPA guidance (2015), potential mitigation measures to be considered may include but shall not be limited to: providing a retrofit program for older higher emitting vehicles, anti-idling requirements or policies, controlling fugitive dust, routing traffic away from populated zones and replacing older buses with cleaner buses. These measures can and should be implemented to reduce localized particulate impacts as needed. ▪ For projects that do not meet screening criteria, retain a qualified air quality consultant to prepare a health risk assessment (HRA) in accordance with CARB and OEHHA requirements to determine the exposure of nearby residents to TAC concentrations. ▪ If impacts result in increased risks to sensitive receptors above significance thresholds, plant trees and/or vegetation suited to trapping TACs and/or sound walls between sensitive receptors and the pollution source. In addition, consistent with the general guidance contained in CARB's *Air Quality and Land Use Handbook* (2005) and Technical Advisory *on Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways* (2017), cities and counties shall incorporate appropriate and feasible measures into project building design for land use projects including residential, school and other sensitive uses located within 500 feet (or other appropriate distance as determined by the lead agency) of freeways, heavily travelled arterials, railways and other sources of diesel particulate matter, including roadways experiencing significant vehicle delays. The appropriate measures shall include one or more of the following methods, as appliable and as determined by a qualified professional. The implementing agency shall incorporate health risk reduction measures based on an analysis of individual sites and project circumstances. These measures may include:	Significant and Unavoidable

Impact	Mitigation Measure(s)	Impact Finding
	▪ Avoid siting new sensitive land uses within 500 feet of a freeway or railway. ▪ Require development projects for new sensitive land uses to be designed to minimize exposure to roadway-related pollutants to the maximum extent feasible through inclusion of design components including air filtration and physical barriers. ▪ Do not locate sensitive receptors near the entry and exit points of a distribution center. ▪ Locate structures and outdoor living areas for sensitive uses as far as possible from the source of emissions. As feasible, locate doors, outdoor living areas and air intake vents primarily on the side of the building away from nearby high volume roadways or other pollution source. As feasible, incorporate dense, tiered vegetation that regains foliage year-round and has a long life span between the pollution source and the project. ▪ Maintain a 50-foot buffer from a typical gas dispensing facility (under 3.6 million gallons of gas per year). ▪ Install, operate, and maintain in good working order a central heating and ventilation (HV) system or other air take system in the building, or in each individual residential unit, that meets the efficiency standard of the MERV 13. The HV system should include the following features: ▫ Installation of a high efficiency filter and/or carbon filter-to-filter particulates and other chemical matter from entering the building. ▫ Use of either HEPA filters or ASHRAE 85 percent supply filters. ▫ Completion of ongoing maintenance. ▪ Retain a qualified HV consultant or Home Energy Rating Systems rater during the design phase of the project to locate the HV system based on exposure modeling from the mobile and/or stationary pollutant sources. ▪ Maintain positive pressure within the building. ▪ Achieve a performance standard of at least one air exchange per hour of fresh outside filtered air. ▪ Achieve a performance standard of at least four air exchanges per hour of recirculation. Achieve a performance standard of 0.25 air exchanges per hour of unfiltered infiltration if the building is not positively pressurized. ▪ Require project owners to provide a disclosure statement to occupants and buyers summarizing technical studies that reflect health concerns about exposure to highway/freeway exhaust emissions.	
Impact AQ-6. Construction of the proposed transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. Impacts would be less than significant.	None required.	Less than Significant

Impact	Mitigation Measure(s)	Impact Finding
Biological Resources		
Impact BIO-1. Implementation of transportation projects and the land use scenario envisioned by the proposed 2022 RTP/SCS may result in impacts to special-status plant and animal species, either directly or through habitat modifications. This impact would be significant but mitigable. For agencies utilizing the SJMSCP, this impact would be less than significant.	**BIO-1(a) Biological Resources Screening and Assessment.** On a project-by-project basis, a preliminary biological resource screening shall be performed as part of the environmental review process to determine whether the project has any potential to impact biological resources. If it is determined that the project has no potential to impact biological resources, no further action is required. If the project would have the potential to impact biological resources, prior to construction, a qualified biologist shall conduct a biological resources assessment (BRA) to document the existing biological resources within the project footprint plus a buffer and to determine the potential impacts to those resources. The biological resources assessment shall evaluate the potential for impacts to all biological resources including, but not limited to: special-status species, nesting birds, wildlife movement, sensitive plant communities, critical habitat, Essential Fish Habitat, and other resources judged to be sensitive by local, state, and/or federal agencies. In addition, the assessment shall document potential modifications to existing infrastructure suitable for wildlife movement (e.g., culvert, underpass, etc.) Pending the results of the BRA, design alterations, further technical studies (i.e., protocol surveys) and/or consultations with the USFWS, CDFW and/or other local, state, and federal agencies may be required. If the project cannot be designed without complete avoidance, the sponsor agency shall coordinate with the appropriate regulatory agency (i.e., USFWS, NMFS, CDFW, USACE) to obtain regulatory permits and implement project - specific mitigation prior to any construction activities. The following mitigation measures [BIO-1(b) through BIO-1(j)] shall be incorporated only as applicable into the BRA for projects where specific resources are present or may be present and impacted by the project. Note that specific surveys described in the mitigation measures below may be completed as part of the biological resources assessment where suitable habitat is present. The results of the biological resources screening and assessment shall be provided to the implementing agency for review and approval. **BIO-1(b) Special-Status Plant Species Surveys.** If completion of the project-specific biological resources assessment determines that special-status plant species have potential to occur on-site, surveys for special-status plants shall be completed prior to any vegetation removal, grubbing, or other construction activity of each project (including staging and mobilization). The surveys shall be floristic in nature and shall be seasonally timed to coincide with the target species identified in the project-specific BRA. All plant surveys shall be conducted by a qualified biologist approved by the implementing agency no more than two years prior to project implementation. All special-status plant species identified on-site shall be mapped onto a site-specific aerial photograph or topographic map. Surveys shall be conducted in accordance with the most current protocols established by the CNPS, CDFW, and/or USFWS. A report of the survey results shall be submitted to the implementing agency for review. If special-status plant species are identified, mitigation measure BIO-1(c) shall apply. **BIO-1(c) Special-Status Plant Species Avoidance, Minimization, and Mitigation.** If state or federally listed and/or CRPR 1 and 2 species are found during special-status plant surveys [pursuant to mitigation measure BIO-1(b)], then the project shall be re-designed to avoid impacting these plant species to the maximum extent feasible. Occurrences of these species that are not within the immediate disturbance footprint but are located within 50 feet of disturbance limits shall have bright orange protective fencing installed at least 30 feet beyond their extent, or other distance as approved by a qualified biologist, to protect them from harm. If CRPR 3 and 4 species are found, the biologist shall	Less than Significant with Mitigation Incorporated Less than Significant for agencies utilizing the SJMSCP

Impact	Mitigation Measure(s)	Impact Finding
	evaluate to determine if they meet criteria to be considered special-status, and if so, the same process as identified for CRPR 1 and 2 species shall apply. If special-status plants species cannot be avoided and would be impacted by a project implemented under the 2022 RTP/SCS, all impacts shall be mitigated at a minimum ratio of 1:1 (number of acres or individuals restored to number of acres or individuals impacted) for each species as a component of habitat restoration. A restoration plan shall be prepared and submitted to SJCOG, and/or the local jurisdiction overseeing the project for approval. The restoration plan shall include, at a minimum, the following components. ▪ Description of the project/impact site (i.e., location, responsible parties, areas to be impacted by habitat type); ▪ Goal(s) of the compensatory mitigation project [type(s) and area(s) of habitat to be established, restored, enhanced, and/or preserved; specific functions and values of habitat type(s) to be established, restored, enhanced, and/or preserved]; ▪ Description of the proposed compensatory mitigation site (location and size, ownership status, existing functions and values); ▪ Implementation plan for the compensatory mitigation site (rationale for expecting implementation success, responsible parties, schedule, site preparation, planting plan); ▪ Maintenance activities during the monitoring period, including weed removal as appropriate (activities, responsible parties, schedule); ▪ Monitoring plan for the compensatory mitigation site, including no less than quarterly monitoring for the first year (performance standards, target functions and values, target acreages to be established, restored, enhanced, and/or preserved, annual monitoring reports); ▪ Success criteria based on the goals and measurable objectives; said criteria to include numeric criteria to be selected based on the scale of the restoration effort and the restoration technique used: ▫ At least 80 percent survival of container plants, and/or ▫ Successful establishment the required number of individuals planted from seed to meet required replacement ratios; and/or ▫ Sampling-based recruitment/survival criteria to achieve vegetative cover or total number of surviving individuals equal to at least 70 percent of the equivalent metric in reference sites for the same habitat type; sampling-based criteria must use a scientifically valid vegetation sampling method; ▪ An adaptive management program and remedial measures to address any shortcomings in meeting success criteria; ▪ Notification of completion of compensatory mitigation and agency confirmation; and ▪ Contingency measures (initiating procedures, alternative locations for contingency compensatory mitigation, funding mechanism). **BIO-1(d) Endangered/Threatened Animal Species Habitat Assessment and Protocol Surveys.** Specific habitat assessment and survey protocol surveys are established for several federally and/or state endangered or threatened species. If the results of the biological resources assessment determine that suitable habitat may be present for any	

Impact	Mitigation Measure(s)	Impact Finding
	such species, protocol habitat assessments/surveys shall be completed in accordance with CDFW and/or USFWS/NMFS protocols prior to issuance of any construction permits/project approvals. Alternatively, in lieu of conducting protocol surveys, the implementing agency may choose to assume presence within the project footprint and proceed with development of appropriate avoidance measures, consultation, and permitting, as applicable. If the target species is detected during protocol surveys, or protocol surveys are not conducted and presence assumed based on suitable habitat, mitigation measure BIO-1(e) shall apply. **BIO-1(e) Endangered/Threatened Animal Species Avoidance and Compensatory Mitigation.** If habitat is occupied or presumed occupied by federal and/or state listed species and would be impacted by the project, the implementing agency shall re-design the project in coordination with a qualified biologist to avoid impacting occupied/presumed occupied habitat to the maximum extent feasible. Disturbance limits shall have bright orange protective fencing installed at least 50 feet beyond their extent, or other distance as approved by a qualified biologist, to protect the habitat. If occupied or presumed occupied habitat cannot be avoided, the implementing agency shall provide the total acreages for habitat that would be impacted prior to the issuance of construction permits/approvals. The implementing agency shall purchase credits at a USFWS, and/or CDFW approved conservation bank and/or establish conservation easements or funds for acquisition of conservation easements as compensatory mitigation to offset impacts to federal and/or state listed species habitat. Compensatory mitigation shall be provided at the following ratios for permanent impacts in accordance with the *San Joaquin County Multi-Species Habitat Conservation and Open Space Plan* (SJMSCP 2000) of not less than 1:1 (area mitigated: area impacted) for agricultural habitat lands and 3:1 for natural lands (non-wetland). Compensatory mitigation may be combined/nested with special-status plant species and sensitive community restoration where applicable. Temporary impact areas shall be restored to pre-project conditions. If the implementing agency establishes conservation easement(s) (on- and/or off-site) to serve as compensatory mitigation for federal and/or state listed species habitat impacts, compensatory mitigation areas shall have a restrictive covenant prohibiting future development/disturbance and shall be managed in perpetuity to encourage persistence and enhancement of the preserved target species. Compensatory mitigation lands cannot be located on land that is currently held publicly for resource protection. The compensatory mitigation areas shall be managed by a conservation lands management entity or other qualified easement holder. In addition, the implementing agency shall retain a qualified biologist to prepare a Habitat Mitigation and Monitoring Plan (HMMP) to ensure the success of compensatory mitigation sites that are to be conserved for compensation of permanent impacts to federal and/or state listed species. The HMMP shall identify long term site management needs, routine monitoring techniques, techniques, and success criteria, and shall determine if the conservation site requires restoration to function as a suitable mitigation site. If restoration is required on the conservation site, the HMMP shall contain the restoration components outlined under the Restoration Plan listed in measure BIO-1(c). The HMMP shall be submitted to the implementing agency for approval. **BIO-1(f) Endangered/Threatened Species Avoidance and Minimization.** The following measures shall be applied to aquatic and terrestrial species, where appropriate. Project sponsors shall select from these measures as appropriate	

Impact	Mitigation Measure(s)	Impact Finding
	depending on site conditions, the species with potential for occurrence, and the results of the biological resources screening and assessment (measure BIO-1[a]). ▪ Preconstruction surveys for federal and/or state listed species with potential to occur shall be conducted where suitable habitat is present by a qualified biologist not more than 48 hours prior to the start of construction activities. The survey area shall include the proposed disturbance area and all proposed ingress/egress routes, plus a 100-foot buffer. If any life stage of federal and/or state listed species is found within the survey area, the appropriate measures in the BO or Habitat Conservation Plan(HCP)/Incidental Take Permit (ITP) issued by the USFWS/NMFS (relevant to federal listed species) and/or the ITP issued by the CDFW (relevant to state listed species) shall be implemented; or if such guidance is not in place for the activity, the USFWS, NMFS and/or CDFW shall be consulted to determine the appropriate course of action. The results of the pre-construction surveys shall be submitted to the implementing agency for review and approval prior to start of construction. ▪ Ground disturbance shall be limited to the minimum necessary to complete the project. The project limits of disturbance shall be flagged. Areas of special biological concern shall have highly visible orange construction fencing. ▪ All projects occurring within/adjacent to aquatic habitats (including riparian habitats and wetlands) shall be completed between April 1 and October 31, to avoid impacts to sensitive aquatic species. ▪ All projects occurring within or adjacent to sensitive habitats that may support federally and/or state endangered/threatened species shall have a qualified biologist present during all initial ground disturbing/vegetation clearing activities. Once initial ground disturbing/vegetation clearing activities have been completed, said biologist shall conduct daily pre-activity clearance surveys for endangered/threatened species. Alternatively, and upon approval of the CDFW and/or USFWS or as outlined in project permits, said biologist may conduct site inspections at a minimum of once per week to ensure all prescribed avoidance and minimization measures are begin fully implemented. ▪ No endangered/threatened species shall be captured and relocated without authorization from the CDFW and/or USFWS. ▪ If pumps are used for dewatering activities, all intakes shall be completely screened with wire mesh not larger than five millimeters to prevent animals from entering the pump system. ▪ If at any time during construction of the project an endangered/threatened species enters the construction site or otherwise may be impacted by the project, all project activities shall cease. At that point the USFWS, NMFS and/or CDFW shall be consulted to determine the appropriate course of action, or the appropriate measures implemented in accordance with the BO or HCP/ITP issued by the USFWS (relevant to federal listed species) and/or the ITP issued by the CDFW (relevant to state listed species) and work can then continue as guided by those documents and the agencies as appropriate. ▪ All vehicle maintenance/fueling/staging shall occur not less than 100 feet from any riparian habitat or water body. Suitable containment procedures shall be implemented to prevent spills. ▪ No equipment shall be permitted to enter wetted portions of any affected drainage channel.	

Impact	Mitigation Measure(s)	Impact Finding
	▪ All equipment operating within streambeds (restricted to conditions in which water is not present) shall be in good conditions and free of leaks. Spill containment shall be installed under all equipment staged within stream areas and extra spill containment and clean up materials shall be located in close proximity for easy access. ▪ At the end of each workday, excavations shall be secured with cover, or a ramp shall be provided to prevent wildlife entrapment. ▪ All trenches, pipes, culverts, or similar structures shall be inspected for animals prior to burying, capping, moving, or filling. **BIO-1(g) Non-Listed Special-status Animal Species Avoidance and Minimization.** Depending on the species identified in the BRA, measures shall be selected from among the following to reduce the potential for impacts to non-listed special-status animal species: ▪ Preconstruction clearance surveys shall be conducted within 14 days prior to the start of construction (including staging and mobilization). The surveys shall cover the entire disturbance footprint plus a minimum 100-foot buffer and shall identify all special-status animal species that may occur on-site. All non-listed special-status species shall be relocated from the site either through direct capture or through passive exclusion. A report of the preconstruction survey shall be submitted to the implementing agency for their review and approval prior to the start of construction. ▪ A qualified biologist shall be present during all initial ground disturbing activities, including vegetation removal, to recover special-status animal species unearthed by construction activities. ▪ Upon completion of the project, a qualified biologist shall prepare a final compliance report documenting all compliance activities implemented for the project, including the preconstruction survey results. The report shall be submitted within 30 days of completion of the project. ▪ If special-status bat species may be present and impacted by the project, within 30 days of the start of construction a qualified biologist shall conduct presence/absence surveys for special-status bats, in consultation with the CDFW, where suitable roosting habitat is present. Surveys shall be conducted using acoustic detectors and by searching tree cavities, crevices, and other areas where bats may roost. If active bat roosts or colonies are present, the biologist shall evaluate the type of roost to determine the next step. ▫ If a maternity colony is present, all construction activities shall be postponed within a 250-foot buffer around the maternity colony until it is determined by a qualified biologist that the young have dispersed or as recommended by CDFW through consultation. Once it has been determined that the roost is clear of bats, the roost shall be removed immediately. ▫ If a roost is determined by a qualified biologist to be used by a large number of bats (large hibernaculum), alternative roosts, such as bat boxes if appropriate for the species, shall be designed and installed near the project site. The number and size of alternative roosts installed will depend on the size of the hibernaculum and shall be determined through consultations with the CDFW. ▫ If other active roosts are located, exclusion devices such as valves, sheeting or flap-style one-way devices that allow bats to exit but not re-enter roosts discourage bats from occupying the site.	

Impact	Mitigation Measure(s)	Impact Finding
	BIO-1(h) Preconstruction Surveys for Nesting Birds. For construction activities occurring during the nesting season (generally February 1 to September 15), surveys for nesting birds covered by the CFGC, the MBTA, and Bald and Golden Eagle Protection Act shall be conducted by a qualified biologist no more than 14 days prior to vegetation removal activities. A qualified biologist shall conduct preconstruction surveys for raptors. The survey for the presence of bald and golden eagles, shall cover all areas within of the disturbance footprint plus a one-mile buffer where access can be secured. The survey area for all other nesting bird and raptor species shall include the disturbance footprint plus a 300-foot and 500-foot buffer, respectively. If active nests (nests with eggs or chicks) are located, the qualified biologist shall establish an appropriate avoidance buffer ranging from 50 to 300 feet based on the species biology and the current and anticipated disturbance levels occurring in vicinity of the nest. The objective of the buffer shall be to reduce disturbance of nesting birds. All buffers shall be marked using high-visibility flagging or fencing, and, unless approved by the qualified biologist, no construction activities shall be allowed within the buffers until the young have fledged from the nest or the nest fails. For bald or golden eagle nests identified during the preconstruction surveys, an avoidance buffer of up to one mile shall be established on a case-by-case basis in consultation with the USFWS and CDFW. The size of the buffer may be influenced by the existing conditions and disturbance regime, relevant landscape characteristics, and the nature, timing, and duration of the expected disturbance. The buffer shall be established between February 1 and September 15; however, buffers may be relaxed earlier than September 15 if a qualified ornithologist determines that a given nest has failed or that all surviving chicks have fledged, and the nest is no longer in use. A report of these preconstruction nesting bird surveys and nest monitoring (if applicable) shall be submitted to the implementing agency for review and approval prior to the start of construction. **BIO-1(i) Fence and Signpost Restriction.** Any fencing posts or signs installed temporarily or permanently throughout the course of the project shall have the top three post holes covered or filled with screws or bolts to prevent the entrapment of wildlife, specifically the talons of birds of prey. Also, fencing shall incorporate wildlife friendly design elements, such as smooth wires and having a 6-inch or greater gap above grade. Fencing shall also be designed to be wildlife friendly (e.g., smooth top wire, smooth bottom wire at 6 inches above grade, etc.). **BIO-1(j) Worker Environmental Awareness Program (WEAP).** Prior to initiation of construction activities (including staging and mobilization), all personnel associated with project construction shall attend WEAP training, conducted by a qualified biologist, to aid workers in recognizing special-status resources that may occur in the project area. The specifics of this program shall include identification of the sensitive species and habitats, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. A fact sheet conveying this information shall also be prepared for distribution to all contractors, their employers, and other personnel involved with construction of the project. All employees shall sign a form documenting that they have attended the WEAP and understand the information presented to them.	

Impact	Mitigation Measure(s)	Impact Finding
Impact BIO-2. Implementation of transportation projects and the land use scenario envisioned by the proposed 2022 RTP/SCS would result in substantial adverse impacts on sensitive habitats, including state or federally protected wetlands. This impact would be significant, but mitigable. This impact would be significant but mitigable. For agencies utilizing the SJMSCP, this impact would be less than significant.	**BIO-2(a) Aquatic Resources Jurisdictional Delineation and Impact Avoidance.** If the results of measure BIO-1(a) indicates projects implemented under the 2022 RTP/SCS occur within or adjacent to wetland, drainages, riparian habitats, or other areas that may fall under the jurisdiction of the CDFW, USACE, and RWQCB, a qualified biologist shall complete an aquatic resources delineation in accordance with the requirement set forth by each agency. The result shall be submitted to the implementing agency, USACE, RWQCB, CDFW as appropriate, for review and approval, and the project shall be designed to minimize impacts to jurisdictional areas to the extent feasible. The delineation shall serve as the basis to identify potentially jurisdictional areas to be protected during construction, through implementation of the avoidance and minimization identified in measure BIO-2(f). If jurisdictional areas are expected to be impacted, then the RWQCB would require a Waste Discharge Requirements (WDR) permit and/or Section 401 Water Quality Certification (depending upon whether the feature falls under federal jurisdiction). If CDFW asserts its jurisdictional authority, then a Streambed Alteration Agreement pursuant to Section 1600 et seq. of the CFGC would also be required prior to construction within the areas of CDFW jurisdiction. If the USACE asserts its authority, then a permit pursuant to Section 404 of the Clean Water Act would likely be required. **BIO-2(b) Wetland, Drainages, and Riparian Habitat Restoration**. Impacts to jurisdictional drainages, wetlands and riparian habitat shall be mitigated in accordance with the SJMSCP at a minimum ratio of 2:1 preservation plus 1:1 creation for vernal pools within the *Vernal Pool Zone*, as mapped by the SJMSCP Zone Map, and at least 1:1 creation plus 2:1 preservation for wetlands other than vernal pools (acres of habitat restored to acres impacted) and shall occur on-site or as close to the impacted habitat as possible. A mitigation and monitoring plan shall be developed by a qualified biologist in accordance with the restoration plan component requirements in mitigation measure BIO-1(c) above and shall be implemented for no less than five years after construction of the segment, or until the implementing agency and/or the permitting authority (e.g., CDFW or USACE) has determined that restoration has been successful. Alternatively, mitigation shall be accomplished through purchase of credits from an approved wetlands mitigation bank. **BIO-2(c) Landscaping Plan.** If landscaping is proposed for a specific project, a qualified biologist/landscape architect shall prepare a landscape plan for that project. This plan shall indicate the locations and species of plants to be installed. Drought tolerant, locally native plant species shall be used. Noxious, invasive, and/or non-native plant species that are recognized on the Federal Noxious Weed List, California Noxious Weeds List, and/or California Invasive Plant Council Inventory as moderate to highly invasive species shall not be permitted. Species selected for planting shall be regionally appropriate native species that are known to occur in the adjacent native habitat types. **BIO-2(d) Sensitive Natural Community Avoidance and Mitigation.** If the results of measure BIO-1(a) indicates projects implemented under the 2022 RTP/SCS would impact sensitive vegetation communities, impacts to sensitive communities shall be avoided through final project design modifications. Bright orange construction fencing shall be placed a minimum of 30 feet outside the edge of areas of sensitive communities that will be retained prior to any initiation of ground disturbance activities and shall remain in place until construction is complete. No vehicles, person, materials, or equipment shall be allowed in protected areas. If the implementing agency determines that sensitive communities cannot be avoided, impacts shall be mitigated on-site or offsite at a ratio of 1:1 for permanently impacted sensitive communities (habitat restored for habitat lost).	Less than Significant with Mitigation Incorporated Less than Significant for agencies utilizing the SJMSCP

Impact	Mitigation Measure(s)	Impact Finding
	Temporarily impacted areas shall be restored to pre-project conditions. A Restoration Plan shall be developed by a qualified biologist. The restoration plan shall be implemented for a period of not less than five years. Off-site habitat acquisition and off-site restoration and/or enhancement may be considered if onsite restoration is determined as unachievable, as long as the off-site proposals result in equal compensatory value. Replacement ratios for off-site mitigation may be different than those required for onsite mitigation. The plan shall include, at a minimum, the same components in accordance with the restoration plan component requirements in mitigation measure BIO-1(c) above. **BIO-2(e) Invasive Weed Prevention and Management Program.** Prior to start of construction for each project that occurs within or adjacent to native habitats, an Invasive Weed Prevention and Management Program shall be developed by a qualified biologist to prevent invasion of native habitat by non-native plant species. The plan shall be submitted to the implementing agency for review and approval. A list of target species shall be included, along with measures for early detection and eradication. The plan, which shall be implemented by the project sponsor, shall also include, but not be limited to, the following measures to prevent the introduction of invasive weed species: ▪ During construction, the project shall make all reasonable efforts to limit the use of imported soils for fill. Soils currently existing on-site should be used for fill material. If the use of imported fill material is necessary, the imported material must be obtained from a source that is known to be free of invasive plant species. ▪ To minimize colonization of disturbed areas and the spread of invasive species, the contractor shall: stockpile topsoil and redeposit the stockpiled soil after construction or transport the topsoil to a permitted landfill for disposal. ▪ The erosion control/ restoration plans for the project must emphasize the use of native species that are expected to occur in the area and that are considered suitable for use at the project site. ▪ All erosion control materials, including straw bales, straw wattles, or mulch used on-site must be free of invasive species seed. ▪ Exotic and invasive plant species shall be excluded from any erosion control seed mixes and/or landscaping plant palettes associated with the proposed project ▪ All disturbed areas shall be hydroseeded with a mix of locally native species upon completion of work in those areas. In areas where construction is ongoing, hydroseeding shall occur where no construction activities have occurred within six (6) weeks since ground disturbing activities ceased. If exotic species invade these areas prior to hydroseeding, weed removal shall occur in consultation with a qualified biologist and in accordance with the restoration plan. **BIO-2(f) Wetlands, Drainages, and Riparian Habitat Best Management Practices During Construction**. The following best management practices shall be required for development within or adjacent to wetlands, drainages, or riparian habitat: ▪ Access routes, staging, and construction areas shall be limited to the minimum area necessary to achieve the project goal and minimize impacts to other waters including locating access routes and ancillary construction areas outside of jurisdictional areas.	

Impact	Mitigation Measure(s)	Impact Finding
	▪ To control sedimentation during and after project implementation, appropriate erosion control materials shall be deployed to minimize adverse effects on jurisdictional areas in the vicinity of the project. ▪ Project activities within the jurisdictional areas should occur during the dry season (typically between June 1 and November 1) in any given year, or as otherwise directed by the regulatory agencies. ▪ During construction, no litter or construction debris shall be placed within jurisdictional areas. All such debris and waste shall be picked up daily and properly disposed of at an appropriate site. ▪ All project-generated debris, building materials, and rubbish shall be removed from jurisdictional areas and from areas where such materials could be washed into them. ▪ Raw cement, concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic species resulting from project-related activities, shall be prevented from contaminating the soil and/or entering wetlands, drainages, or riparian habitat. ▪ All refueling, maintenance, and staging of equipment and vehicles shall occur at least 100 feet from bodies of water and in a location where a potential spill would not drain directly toward aquatic habitat (e.g., on a slope that drains away from the water source). Prior to the onset of work activities, a plan must be in place for prompt and effective response to any accidental spills.	
Impact BIO-3. Implementation of transportation projects and the land use scenario envisioned by the proposed 2022 RTP/SCS would interfere substantially with wildlife movement, including fish migration, and/or impede the use of native wildlife nursery sites. This impact would be significant, and unavoidable.	**BIO-3(a) Project Design for Wildlife Connectivity.** The implementing agency shall implement the following measures. All projects including long segments of fencing and lighting shall be designed to minimize impacts to wildlife. Where fencing or other project components is required for public safety concerns, these project components shall be designed to permit wildlife movement by incorporating design features such as: ▪ A minimum 16 inches between the ground and the bottom of the fence to provide clearance for small animals; ▪ A minimum 12 inches between the top two wires, or top the fence with a wooden rail, mesh, or chain link instead of wire to prevent animals from becoming entangled; ▪ If privacy fencing is required near open space areas, openings at the bottom of the fence measure at least 16 inches in diameter shall be installed at reasonable intervals to allow wildlife movement, or the fence may be installed with the bottom at least 16 inches above the ground level; ▪ If fencing or other project components must be designed in such a manner that wildlife passage would not be permitted, wildlife crossing structures shall be incorporated into the project design as appropriate; and ▪ Lighting installed as part of any project shall be designed to be minimally disruptive to wildlife (see mitigation measure AES-3(a) Roadway Lighting for lighting requirements). **BIO-3(b) Maintain Connectivity in Drainages.** No permanent structures shall be placed within any drainage or river that would impede wildlife movement (i.e., no hardened caps or other structures in the stream channel perpendicular to stream flow be left exposed or at depth with moderate to high risk for exposure as a result of natural bed scour during high flow events and thereby potentially create impediments to passage). In addition, upon completion of construction within any drainage, areas of stream channel and banks that are temporarily impacted shall be returned to pre-construction contours and in a condition that allows for unimpeded passage through the area once the work has been complete.	Significant and Unavoidable

Impact	Mitigation Measure(s)	Impact Finding
	If water is to be diverted around work sites, a diversion plan shall be submitted to SJCOG and/or local jurisdiction for review and approval prior to issuance of project construction permits/approvals. The diversion shall be designed in a way as to not impede movement while the diversion is in place. **BIO-3 (c) Construction Best Management Practices to Minimize Disruption to Wildlife.** The following construction BMPs shall be incorporated into all grading and construction plans in order to minimize temporary disruption of wildlife, which could hinder wildlife movement: ▪ Designation of a 20 mile per hour speed limit in all construction areas. ▪ Daily construction work schedules shall be limited to daylight hours only. ▪ Mufflers shall be used on all construction equipment and vehicles shall be in good operating condition. ▪ All trash shall be placed in sealed containers and shall be removed from the project site a minimum of once per week. ▪ No pets are permitted on project site during construction.	
Impact BIO-4. Implementation of transportation improvements and the land use scenario envisioned by the proposed 2022 RTP/SCS would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy. This impact would be less than significant.	None required.	Less than Significant
Impact BIO-5. Implementation of transportation projects and the land use scenario envisioned by the 2022 RTP/SCS would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Impacts would be significant, but mitigable.	Implementation of Mitigation Measures BIO-1(a) through BIO-3(c) are required.	Less than Significant with Mitigation Incorporated

Impact	Mitigation Measure(s)	Impact Finding
Cultural Resources		
Impact CR-1. Transportation improvement projects and the land use scenario envisioned by the proposed 2022 RTP/SCS would cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5. This impact would be significant and unavoidable.	**CR-1 Built Environment Historical Resources Impact Mitigation.** Prior to individual project permit issuance, the implementing agency of a 2022 RTP/SCS project involving a building or structure over 45 years of age shall prepare a map defining the project area. This map shall indicate the areas of disturbance associated with construction and operation of the facility and will help in determining whether known and potential historical resources are located within the project area. If a structure greater than 45 years in age is within the identified impact zone, a survey and evaluation of the structure(s) to determine their eligibility for recognition under State, federal, or local historic resource designation criteria shall be conducted. The evaluation shall be prepared by an architectural historian or historical architect meeting the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, Professional Qualification Standards (PQS) as defined in 36 CFR Part 61. All buildings and structures 45 years of age or older within the project area shall be evaluated in their historic context and documented in a report meeting the State Office of Historic Preservation guidelines. All evaluated properties shall be documented on Department of Parks and Recreation Series 523 Forms. The report shall be submitted to the implementing agency for review and concurrence. If historical resources are identified within the project area of a proposed development, efforts shall be made to the extent feasible to ensure that impacts are mitigated. Application of mitigation shall generally be overseen by a qualified architectural historian or historic architect meeting the PQS, unless unnecessary in the circumstances (e.g., preservation in place). In conjunction with any development application that may affect the historical resource, a report identifying and specifying the treatment of character-defining features and construction activities shall be provided to the implementing agency for review. To the greatest extent possible the relocation, rehabilitation, or alteration of the resource shall be consistent with the *Secretary of the Interior's Standards for the Treatments of Historic Properties* (Standards). In accordance with CEQA, a project that has been determined to conform with the Standards generally would not cause a significant adverse direct or indirect impact to historical resources (14 CCR § 15126.4[b()[1]). Application of the Standards shall be overseen by a qualified architectural historian or historic architect meeting the PQS. In conjunction with any development application that may affect the historical resource, a report identifying and specifying the treatment of character-defining features and construction activities shall be provided to the implementing agency for review and concurrence. If significant historical resources are identified on a development site and compliance with the Standards and/or avoidance is not possible, appropriate site-specific mitigation measures shall be established and undertaken. Mitigation measures may include documentation of the historical resource in the form of a Historic American Building Survey-Like report. The report shall comply with the Secretary of the Interior's Standards for Architectural and Engineering Documentation and shall generally follow the HABS Level III requirements, including digital photographic recordation, detailed historic narrative report, and compilation of historic research. The documentation shall be completed by a qualified architectural historian or historian who meets the PQS and submitted to the implementing	Significant and Unavoidable

Impact	Mitigation Measure(s)	Impact Finding
	agency prior to issuance of any permits for demolition or alteration of the historical resource. Copies of the report shall be provided to a local library and/or other appropriate repositories.	
Impact CR-2. Construction activity associated with transportation improvement projects and the land use scenario envisioned by the proposed 2022 RTP/SCS may cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5. Potential impacts to archaeological resources would be significant and unavoidable.	**CR-2(a) Archaeological Resources Impact Minimization.** Before construction activities, implementing agencies shall retain a qualified archaeologist to conduct a record search at the Central California Information Center to determine whether the project area has been previously surveyed and whether resources were identified. When recommended by the Information Center, implementing agencies shall retain a qualified archaeologist to conduct archaeological surveys before construction activities. Implementing agencies shall, or can and should, follow recommendations identified in the survey, which may include, but would not be limited to: subsurface testing, designing and implementing a Worker Environmental Awareness Program (WEAP), construction monitoring by a qualified archaeologist, or avoidance of sites and preservation in place, and/or data recovery if avoidance is not feasible. Recommended mitigation measures shall be consistent with CEQA Guidelines Section 15126.4(b)(3) recommendations and may include but not be limited to preservation in place and/or data recovery. All cultural resources work shall follow accepted professional standards in recording any find including submittal of standard DPR Primary Record forms (Form DPR 523) and location information to the appropriate California Historical Resources Information System office for the project area. **CR-2(b) Unanticipated Discoveries During Construction.** During construction activities, implementing agencies shall, or can and should, implement the following measures. If evidence of any prehistoric or historic-era subsurface archaeological features, deposits or tribal cultural resources are discovered during construction-related earthmoving activities (e.g., ceramic shard, trash scatters, lithic scatters), all ground-disturbing activity proximate to the discovery shall be halted until a qualified archaeologist (36 CFR Section 61) can assess the significance of the find. If the find is a prehistoric archaeological site, the appropriate Native American group shall be notified. If the archaeologist determines that the find does not meet the CRHR standards of significance for cultural resources, construction may proceed. If the archaeologist determines that further information is needed to evaluate significance, a testing plan shall be prepared and implemented. If the find is determined to be significant by the qualified archaeologist (i.e., because the find is determined to constitute either an historical resource or a unique archaeological resource), the archaeologist shall work with the implementing agency to avoid disturbance to the resources, and if complete avoidance is not feasible in light of project design, economics, logistics and other factors, shall recommend additional measures such as the preparation and implementation of a data recovery plan. All cultural resources work shall follow accepted professional standards in recording any find including submittal of standard DPR Primary Record forms (Form DPR 523) and location information to the appropriate California Historical Resources Information System office for the project area. If the find is a prehistoric archaeological site, the culturally affiliated California Native American tribe shall be notified and afforded the opportunity to monitor mitigative treatment. During evaluation or mitigative treatment, ground disturbance and construction work could continue in other parts of the project area that are distant enough from the find not to impact it, as determined by the qualified archaeologist.	Significant and Unavoidable
Impact CR-3. Construction activity associated with transportation improvement projects and the land use	None required.	Less than Significant

Impact	Mitigation Measure(s)	Impact Finding
scenario envisioned by the 2022 RTP/SCS could result in disturbances to human remains including those interred outside of formal cemeteries. Potential impacts to human remains would be less than significant.		
Energy		
Impact E-1. Future transportation improvement projects and implementation of the land use scenario envisioned by the proposed 2022 RTP/SCS would not result in significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources. This impact would be less than significant.	None required.	Less than Significant
Impact E-2. The proposed 2022 RTP/SCS would not increase reliance on fossil fuels or decrease reliance on renewable energy sources. This impact would be less than significant.	None required.	Less than Significant
Impact E-3. The proposed 2022 RTP/SCS would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. This impact would be less than significant.	None required.	Less than Significant

Impact	Mitigation Measure(s)	Impact Finding
Agriculture and Forestry Resources		
Impact AG-1. The proposed 2022 RTP/SCS could result in the conversion of important farmland to nonagricultural use, and/or conflict with existing zoning for agriculture. This impact would be significant and unavoidable.	**AG-1 Impact Avoidance and Minimization.** Project sponsors shall implement measures, where feasible and necessary based on project-and site-specific considerations that include but are not limited to those identified below. ▪ Require project relocation or corridor realignment, where feasible, to avoid Important Farmland; ▪ Manage project construction to minimize the introduction of invasive species or weeds that may affect agricultural production on agricultural land adjacent to project sites. Managing project construction may include washing construction equipment before bringing equipment on-site, using certified weed-free straw bales for construction Best Management Practices (BMPs), and other similar measures. ▪ Provide buffers, berms, setbacks, fencing, or other project design measures to protect surrounding agriculture, and to reduce conflict with farming that could result from implementation of transportation improvements and/or development included as a part of the RTP/SCS; ▪ Achieve compensatory mitigation in advance of impacts through purchase or creation of mitigation credits or the implementation of mitigation projects through Regional Advance Mitigation Planning, as deemed appropriate by permitting agencies; and/or ▪ Require acquisition of conservation easements on land in the same jurisdiction, if feasible, and at least equal in quality and size to converted Important Farmland, to offset the loss of Important Farmland.	Significant and Unavoidable
Impact AG-2. The proposed 2022 RTP/SCS would not conflict with existing zoning for forest land, timberland, or timberland production, and would not convert forest land to non-forest uses. This impact would be less than significant.	None required.	Less than Significant
Environmental Justice		
Impact EJ-1. The proposed transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would not result in adverse impacts to EJ households. This impact would be less than significant.	None required.	Less than Significant

Impact	Mitigation Measure(s)	Impact Finding
Impact EJ-2. The proposed transportation improvements envisioned by the Proposed 2022 RTP/SCS would not result in a disproportionately lower distribution of benefits to EJ communities. This impact would be less than significant.	None required.	Less than Significant
Impact EJ-3. Implementation of the land use scenario envisioned by the proposed 2022 RTP/SCS would increase the availability of affordable housing stock. This impact would be less than significant.	None required.	Less than Significant
Geology and Soils		
Impact GEO-1. The transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides. Impacts would be less than significant.	None required.	Less than Significant
Impact GEO-2. The proposed transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would not result	None required.	Less than Significant

Impact	Mitigation Measure(s)	Impact Finding
in substantial soil erosion or the loss of topsoil. Impacts would be less than significant.		
Impact GEO-3. Implementation of transportation improvements and future projects included in the land use scenario envisioned in the proposed 2022 RTP/SCS could be located on potentially unstable soils, in areas of lateral spreading, subsidence, or high liquefaction potential, or areas of expansive soil. Impacts would be Less than significant.	None required.	Less than Significant
Impact GEO-4. The transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS in rural areas may have soils incapable of adequately supporting septic tanks or alternative wastewater disposal systems. Impacts would be less than significant.	None required.	Less than Significant
Impact GEO-5. Implementation of the proposed transportation improvements and the land use scenario envisioned by 2022 RTP/SCS could cause a substantial adverse change in or disturb known and unknown paleontological resources as defined in CEQA guidelines	**GEO-5 Paleontological Resources Mitigation and Monitoring Program.** The implementing agency of a proposed 2022 RTP/SCS project involving ground disturbing activities (including grading, trenching, foundation work and other excavations) shall, or can and should, retain a qualified paleontologist, defined as a paleontologist who meets the Society of Vertebrate Paleontology (SVP) standards for Qualified Professional Paleontologist (SVP 2010), to conduct a Paleontological Resources Assessment (PRA). The PRA shall determine the age and paleontological sensitivity of geologic formations underlying the proposed disturbance area, consistent with SVP Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources (SVP 2010) guidelines for categorizing paleontological sensitivity of geologic units within a project area. If underlying formations are found to have a high potential (sensitivity) for paleontological resources and/or could be considered a unique geologic feature, the following measures shall apply:	Significant and Unavoidable

Impact	Mitigation Measure(s)	Impact Finding
section 15064.5. Impacts to paleontological resources would be significant and unavoidable.	▪ **Avoidance.** Avoid routes and project designs that would permanently alter unique paleontological and geological features. If avoidance practices cannot be implemented, the following measures shall apply. ▪ **Retention of a Qualified Paleontologist.** A Qualified Paleontologist shall be retained to create a Paleontological Resources Monitoring and Mitigation Program (PRMMP) to direct all mitigation measures related to paleontological resources. The Qualified Paleontologist shall meet the qualifications for a Qualified Professional Paleontologist, which is defined by the SVP as an individual, preferably with an M.S. or Ph.D. in paleontology or geology, who is experienced with paleontological procedures and techniques, who is knowledgeable in the geology of California, and who has worked as a paleontological mitigation project supervisor for a least two years (SVP 2010). ▪ **Paleontological Worker Environmental Awareness Program (WEAP).** Prior to the start of ground disturbance activity, construction personnel shall be informed on the appearance of fossils and the procedures for notifying paleontological staff should fossils be discovered by construction staff. ▪ **Paleontological Monitoring.** Paleontological monitoring shall be conducted by a qualified paleontological monitor, who is defined as an individual who has experience with collection and salvage of paleontological resources and meets the minimum standards of the SVP (2010) for a Paleontological Resources Monitor. The duration and timing of the monitoring will be determined by the Qualified Paleontologist based on the observation of the geologic setting from initial ground disturbance. If the Qualified Paleontologist determines that full-time monitoring is no longer warranted, based on the specific geologic conditions once the full depth of excavations has been reached, they may recommend that monitoring be reduced to periodic spot-checking or ceased entirely. Monitoring shall be reinstated if any new ground disturbances are required, and reduction or suspension shall be reconsidered by the Qualified Paleontologist at that time. In the event of a fossil discovery by the paleontological monitor or construction personnel, all work in the immediate vicinity of the find shall cease. A Qualified Paleontologist shall evaluate the find before restarting construction activity in the area. If it is determined that the fossil(s) is (are) scientifically significant, the Qualified Paleontologist shall complete the following conditions to mitigate impacts to significant fossil resources: ▪ **Fossil Salvage**. If fossils are discovered, the implementing agency shall be notified immediately, and the qualified paleontologist (or paleontological monitor) shall recover them. Typically, fossils can be safely salvaged quickly by a single paleontologist and not disrupt construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. In this case, the paleontologist should have the authority to temporarily direct, divert or halt construction activity to ensure that the fossil(s) can be removed in a safe and timely manner. ▪ **Preparation and Curation of Recovered Fossils**. Once salvaged, fossils shall be identified to the lowest possible taxonomic level, prepared to a curation-ready condition, and curated in a scientific institution with a permanent paleontological collection along with all pertinent field notes, photos, data, and maps. ▪ **Final Paleontological Mitigation and Monitoring Report**. Upon completion of ground disturbing activity (and curation of fossils, if necessary) the Qualified Paleontologist shall prepare a final mitigation and monitoring report outlining the results of the PRMMP. The report shall include discussion of the location, duration and methods of the monitoring, stratigraphic sections, any recovered fossils, and the scientific significance of those fossils, and	

Impact	Mitigation Measure(s)	Impact Finding
	where fossils were curated. The report shall be submitted to the sponsor agency. If the monitoring efforts recovered fossils, then a copy of the report shall also be submitted to the designated museum repository	
Greenhouse Gas Emissions and Climate Change		
Impact GHG-1. Construction of the transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would generate GHG emissions that may have a significant impact on the environment. Impacts would be significant and unavoidable.	**GHG-1 Construction GHG Reduction Measures.** The project sponsor shall incorporate the most recent GHG emission reduction measures for off-road construction vehicles during construction. The measures shall be noted on all construction plans, and the implementing agency shall perform periodic site inspections. Current GHG-reducing measures include the following: ▪ Use of diesel construction equipment meeting CARB's Tier 4 certified engines wherever feasible for off-road heavy-duty diesel engines and comply with the State Off-Road Regulation. Where the use of Tier 4 engines is not feasible, Tier 3 certified engines shall be used; where the use of Tier 3 engines are not feasible, Tier 2 certified engines shall be used; ▪ Use of on-road heavy-duty trucks that meet CARB's 2007 or cleaner certification standard for on-road heavy-duty diesel engines, and comply with the State On-Road Regulation; ▪ Minimizing idling time (e.g., five-minute maximum). Signs shall be posted in the designated queuing areas and or job sites to remind drivers and operators of the five-minute idling limit; ▪ Use of electric-powered equipment in place of diesel-powered equipment when feasible; ▪ Use of alternatively fueled or catalyst-equipped diesel construction equipment when feasible, to the extent electric powered equipment is not feasible; ▪ Substitute gasoline-powered in place of diesel-powered equipment, when neither electric-powered equipment or alternatively fueled or catalyst-equipped diesel equipment is feasible; and ▪ Incentives for construction workers to carpool and/or use electric vehicles to commute to and from the project site.	Significant and Unavoidable
Impact GHG-2. Proposed transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would result in a net increase in GHG emissions by 2046 compared to the existing baseline conditions and would therefore have a significant impact on the environment. Impacts would be significant and unavoidable.	**GHG-2 Land Use Project Energy Consumption and Water Use Reduction Measures.** For land use projects under their jurisdiction, cities and the County can and should implement measures to reduce energy consumption, water use, solid waste generation, and VMT, all of which contribute to GHG emissions. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. These measures include, but are not limited to: ▪ Require new residential and commercial construction to install solar energy systems or be solar-ready ▪ Require new residential and commercial development to install low flow water fixtures ▪ Require new residential and commercial development to install water-efficient drought-tolerant landscaping, including the use of compost and mulch ▪ Require new development to exceed the applicable Title 24 energy-efficiency requirements ▪ Require new development to be fully electric ▪ Require new residential and commercial development to offer information on recycling, composting, and disposal of household hazardous waste and e-waste ▪ Require new development to implement circulation design elements in parking lots for no-residential uses to reduce vehicle queuing and improve the pedestrian environment	Significant and unavoidable

Impact	Mitigation Measure(s)	Impact Finding
Impact GHG-3. The transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would not conflict with regional SB 375 per capita passenger vehicle CO_2 emission reduction targets of 16 percent by 2035 from 2005 levels. Impacts would be less than significant.	None required.	Less than Significant
Impact GHG-4. Implementation of the proposed 2022 RTP/SCS would conflict with the State's ability to achieve SB 32, EOs S-3-05 and B-55-18, and applicable local GHG reduction plan targets and goals. Impacts would be significant and unavoidable.	**GHG-4(a) Transportation-Related GHG Reduction Measures**. The implementing agency shall incorporate the most recent GHG emission reduction measures and/or technologies for reducing VMT and associated transportation related GHG emissions. Current GHG-reducing measures include the following: ▪ Installation of electric vehicle charging stations beyond those required by State and local codes ▪ Utilization of electric vehicles and/or alternatively fueled vehicles in company fleet ▪ Provision of dedicated parking for carpools, vanpool, and clean air vehicles ▪ Provision of vanpool and/or shuttle service for employees ▪ Implementation of reduced parking minimum requirements ▪ Implementation of maximum parking limits ▪ Provision of bicycle parking facilities beyond those required by State and local codes ▪ Provision of a bicycle-share program ▪ Expansion of bicycle routes/lanes along the project site frontage ▪ Provision of new or improved transit amenities (e.g., covered turnouts, bicycle racks, covered benches, signage, lighting) if project site is located along an existing transit route ▪ Expansion of existing transit routes ▪ Provision of transit subsidies ▪ Expansion of sidewalk infrastructure along the project site frontage ▪ Provision of safe, pedestrian-friendly, and interconnected sidewalks and streetscapes ▪ Provision of employee lockers and showers ▪ Provision of on-site services that reduce the need for off-site travel (e.g., childcare facilities, automatic teller machines, postal machines, food services) ▪ Provision of alternative work schedule options, such as telework or reduced schedule (e.g., 9/80 or 10/40 schedules), for employees ▪ Implementation of transportation demand management programs to educate and incentivize residents and/or employees to use transit, smart commute, and alternative transportation options	Significant and Unavoidable

Impact	Mitigation Measure(s)	Impact Finding
Hazards and Hazardous Materials		
Impact HAZ-1. Transportation improvement projects and land use patterns included in the 2022 RTP/SCS may facilitate the routine transport, use, or disposal of hazardous material, and may result in reasonably foreseeable upset and accident conditions. Mandatory compliance with existing regulations and programs would minimize the risk associated with these activities or accident conditions. Impacts would be less than significant.	None required.	Less than Significant
Impact HAZ-2. Transportation improvement projects and land use patterns included in the 2022 RTP/SCS may facilitate the routine transport, use, or disposal of hazardous material, and may result in reasonably foreseeable upset and accident conditions. Mandatory compliance with existing regulations and programs would minimize the risk associated with these activities or accident conditions. Impacts would be less than significant.	None required.	Less than Significant
Impact HAZ-3. The 2022 RTP/SCS includes land use patterns and transportation projects that could occur on	**HAZ-3 Site Remediation.** If an individual project included in the 2022 RTP/SCS is located on or near a hazardous material and/or waste site pursuant to Government Code Section 65962.5 or has the potential for residual hazardous materials and/or waste as a result of location and/or prior uses, the project sponsor shall prepare a Phase I ESA in accordance with the American Society for Testing and Materials' E-1527-05 standard. For work requiring any	Less than Significant with Mitigation Incorporated

Impact	Mitigation Measure(s)	Impact Finding
previously unknown hazardous material sites or sites on the list compiled by Government Code Section 65962.5, and therefore create a significant hazard to the public or environment. This impact would be significant but mitigable.	demolition or renovation, the Phase I ESA shall make recommendations for any hazardous building materials survey work that shall be done. All recommendations included in a Phase I ESA prepared for a site shall be implemented. If a Phase I ESA indicates the presence or likely presence of contamination, the implementing agency shall require a Phase II ESA, and recommendations of the Phase II ESA shall be fully implemented. Examples of typical recommendations provided in Phase I/II ESAs include removal of contaminated soil in accordance with a soil management plan approved by the local environmental health department; covering stockpiles of contaminated soil to prevent fugitive dust emissions; capturing groundwater encountered during construction in a holding tank for additional testing and characterization and disposal based on its characterization; and development of a health and safety plan for construction workers. For any project located on or near sites that are not listed and do not have the potential for residual hazardous materials as a result of historic land uses, no action is required unless unknown hazards are discovered during development. In that case, the implementing agency shall discontinue development until DTSC, RWQCB, SJVAPCD, and/or other responsible agency issues a determination, which would likely require a Phase I ESA as part of the assessment.	
Impact HAZ-4. Transportation improvement projects and land use scenario envisioned by the 2022 RTP/SCS may be located at or near a public use airport or private airstrip. Existing regulations and regulatory oversight would reduce the inherent hazard of development near airports to safe levels, and this impact would be less than significant.	None required.	Less than Significant
Impact HAZ-5. Transportation improvement projects and the land use scenario envisioned by the 2022 RTP/SCS could interfere with existing emergency response and evacuation. However, required regular updates to emergency response and evacuation plans would account for development and projects and standard notification of	None required.	Less than Significant

Impact	Mitigation Measure(s)	Impact Finding
emergency response agencies during construction activities would ensure evacuation and response routes are modified appropriately. Impacts related to interference or impairment of an adopted emergency response plan or emergency evacuation plan would be less than significant.		
Hydrology and Water Quality		
Impact HYD-1. Implementation of proposed transportation projects and future projects included in the land use scenario envisioned in the proposed 2022 RTP/SCS would not violate water quality standards or waste discharge requirements, or otherwise substantially degrade surface or ground water quality. Impacts would be less than significant.	None required.	Less than Significant
Impact HYD-2. Implementation of proposed transportation and land use projects envisioned in the proposed 2022 RTP/SCS would substantially decrease groundwater supplies. and interfere with groundwater recharge such that it may impede sustainable groundwater management of the basins. Impacts would be significant and unavoidable.	**HYD-2(a) Construction Dust Suppression Water Supply**. For all proposed 2022 RTP/SCS projects, where feasible, reclaimed and/or recycled water shall be used for dust suppression during construction activities. This includes use of such reclaimed water in water trucks utilized for project construction occurring outside developed areas and away from water infrastructure which would otherwise provide such reclaimed water. It should be noted that use of reclaimed water in water trucks is generally no different than use of potable water, and therefore use of reclaimed water in projects that will require the use of water trucks should be given extra consideration as a measure which can enable use of reclaimed water in areas where it would otherwise be impossible due to lack of infrastructure. This measure shall be noted on construction plans and shall be spot checked by the local jurisdiction. **HYD-2(b) Landscape Watering.** In jurisdictions that do not already have an appropriate local regulatory program related to landscape watering, or for proposed 2022 RTP/SCS projects that are not required to comply with AB 1881, projects that include landscaping shall be designed with drought tolerant plants and drip irrigation. When feasible, native plant species shall be used. In addition, landscaping associated with proposed improvements shall be maintained using reclaimed water when feasible. If reclaimed water could feasibly be utilized for project landscape	Significant and Unavoidable

Impact	Mitigation Measure(s)	Impact Finding
	watering due to proximity of reclaimed water sources but is unavailable due to lack of connecting infrastructure, local agencies or transportation sponsors shall conduct an analysis of the upgrades needed to provide such infrastructure, which will include the potential for new connections to existing reclaimed water systems to provide reclaimed water to other nearby sources besides the proposed project in the analysis, and shall perform such steps as necessary to utilize available reclaimed water if feasible.	
Impact HYD-3. Transportation and future land use projects implementing the proposed 2022 RTP/SCS would not substantially alter the existing drainage pattern of a site or area through alteration of the course of a stream or river or through the addition of impervious surfaces in a manner where drainage changes would result in flooding on- or off-site, redirect or impede flood flows, exceed the capacity of stormwater systems, or provide additional polluted runoff. Impacts would be less than significant.	None required.	Less than Significant
Impact HYD-4. Transportation and land use projects implementing the proposed 2022 RTP/SCS would not risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones. Impacts would be less than significant.	None required.	Less than significant
Impact HYD-5. Transportation and land use projects implementing the proposed 2022 RTP/SCS would not	None required.	Less than significant.

Impact	Mitigation Measure(s)	Impact Finding
conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plans. Impacts would be less than significant.		
Land Use & Planning		
Impact LU-1. Implementation of proposed transportation improvements and the land use scenario envisioned by the proposed 2022 RTP/SCS would not physically divide an established community. This impact would be less than significant.	None required.	Less than Significant
Impact LU-2. 2022 RTP/SCS project implementation would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation) and result in a physical change to the environment. This impact would be less than significant.	Mitigation measures are provided for applicable resources throughout their respective environmental issue area sections of the EIR to reduce impacts.	Less than Significant
Noise		
Impact N-1. Construction activity associated with transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would generate a substantial temporary increase in ambient noise levels in excess of standards established in local general plans or noise ordinances and	**N-1 Construction Noise Reduction.** To reduce construction noise levels to achieve applicable standards, implementing agencies for transportation and land use projects shall implement the measures identified below where feasible and necessary. a. **Compliance with local Construction Noise Regulations.** Implementing agencies shall ensure that, where residences or other noise sensitive uses are located within 800 feet of construction sites without pile driving, appropriate measures shall be implemented to ensure consistency with local noise ordinance requirements relating to construction. Specific techniques may include, but are not limited to, restrictions on construction timing, use of sound blankets on construction equipment, and the use of temporary walls and noise barriers to block and deflect noise.	Significant and Unavoidable

Impact	Mitigation Measure(s)	Impact Finding
would generate a substantial absolute noise increase over existing noise levels. This impact would be significant and unavoidable.	b. **Noise Complaint and Enforcement Manager.** Designate an on-site construction complaint and enforcement manager for projects within 800 feet of sensitive receivers. Implementing agencies shall post phone numbers for the on-site enforcement manager at construction sites along with complaint procedures and who to notify in the event of a problem. c. **Pile Driving**. For any project within 3,200 feet of sensitive receptors that requires pilings, the implementing agency shall require caisson drilling or sonic pile driving as opposed to pile driving, where feasible. This shall be accomplished through the placement of conditions on the project during its individual environmental review. d. **Construction Equipment Noise Control**. Implementing agencies shall ensure that equipment and trucks used for project construction utilize the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds). e. **Impact Equipment Noise Control.** Implementing agencies shall ensure that impact equipment (e.g., jack hammers, pavement breakers, and rock drills) used for project construction be hydraulically or electrically powered wherever feasible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatically powered tools is unavoidable, use of an exhaust muffler on the compressed air exhaust can lower noise levels from the exhaust by up to about 10 dBA. When feasible, external jackets on the impact equipment can achieve a reduction of 5 dBA. Whenever feasible, use quieter procedures, such as drilling rather than impact equipment operation. f. **Construction Activity Timing Restrictions.** The following timing restrictions shall apply to 2022 RTP/SCS activates creating noise levels at or above 65 dBA at a nearby dwelling unit, except where timing restrictions are already established in local codes or policies. Construction activities shall be limited to: ▪ Monday through Friday: 7 a.m. to 6 p.m. ▪ Saturday: 9 a.m. to 5 p.m. g. **Placement of Stationary Noise Sources.** Locate stationary noise sources as far from noise-sensitive receptors as possible. Stationary noise sources that must be located near existing receptors will be equipped with the best available mufflers.	
Impact N-2. Proposed transportation improvements envisioned by the proposed 2022 RTP/SCS would generate a substantial permanent increase in ambient noise levels in excess of standards or over existing noise levels and generate a substantial absolute noise increase over existing noise levels. This	**N-2 Noise Assessment and Control for Mobile and Point Source Reduction.** Implementing agencies shall complete detailed noise assessments using applicable guidelines (e.g., Caltrans Traffic Noise Analysis Protocol) for roadway and rail projects that may impact noise sensitive receptors. The implementing agency shall ensure that a noise survey is conducted that, at minimum: ▪ Determines existing and projected noise levels ▪ Determines the amount of attenuation needed to reduce potential noise impacts to applicable State and local standards ▪ Identifies potential alternate alignments that allow greater distance from, or greater buffering of, noise-sensitive areas ▪ If warranted, recommends methods for mitigating noise impacts, including: ▫ Appropriate setbacks	Significant and Unavoidable

<table>
<tr><th>Impact</th><th>Mitigation Measure(s)</th><th>Impact Finding</th></tr>
<tr><td>impact would be significant and unavoidable.</td><td>

Sound attenuating building design, including retrofit of existing structures with sound attenuating building materials
Use of sound barriers (earthen berms, sound walls, or some combination of the two)
Locate transit-related passenger stations, central maintenance facilities, decentralized maintenance facilities, and electric substations away from sensitive receptors to the maximum extent feasible

Where new or expanded roadways or transit are found to expose receptors to noise exceeding normally acceptable levels, the individual project lead agency shall implement techniques as recommended in the project-specific noise assessments. The preferred methods for mitigating noise impacts shall include the use of appropriate setbacks and sound attenuating building design, including retrofit of existing structures with sound attenuating building materials where feasible. In instances where use of these techniques is not feasible, the use of sound barriers (earthen berms, sound walls, or some combination of the two) shall be considered. Long expanses of walls or fences may be interrupted with offsets and provided with accents to prevent monotony. Landscape pockets and pedestrian access through walls may be provided. Whenever possible, a combination of elements shall be used, including open grade paving, solid fences, walls, and landscaped berms. Other techniques such as rubberized asphalt or “quiet pavement” shall be used where feasible to reduce road noise for new roadway segments or modifications requiring repaving. The effectiveness of noise reduction measures shall be monitored by taking noise measurements and installing adaptive mitigation measures to achieve applicable standards</td><td></td></tr>
<tr><td>Impact N-3. Construction activities associated with transportation projects and land use projects would generate excessive groundborne vibration levels. New truck and bus traffic resulting from the 2022 RTP/SCS would generate excessive vibration levels. These impacts would be significant and unavoidable.</td><td>N-3(a) Vibration Mitigation for Construction of Transportation Projects. Where local vibration and groundborne noise standards do not apply, implementing agencies of proposed 2022 RTP/SCS projects utilizing heavy construction equipment shall estimate vibration levels generated by construction activities and use the Caltrans vibration damage potential threshold criteria to screen for and screen out projects as to their potential to damage buildings on site or near a project.
Caltrans Vibration Damage Potential Threshold Criteria
<table>
<tr><th rowspan="2">Structure and Condition</th><th colspan="2">Maximum PPV (in/sec)</th></tr>
<tr><th>Transient Sources</th><th>Continuous/
Frequent Intermittent Sources</th></tr>
<tr><td>Extremely fragile historic buildings</td><td>0.12</td><td>0.08</td></tr>
<tr><td>Fragile buildings</td><td>0.20</td><td>0.10</td></tr>
<tr><td>Historic and some old buildings</td><td>0.50</td><td>0.25</td></tr>
<tr><td>Older Residential structures</td><td>0.50</td><td>0.30</td></tr>
<tr><td>New residential structures</td><td>1.00</td><td>0.50</td></tr>
<tr><td>Modern industrial structures</td><td>2.00</td><td>0.50</td></tr>
<tr><td colspan="3">Source: Transportation and Construction Vibration Guidance Manual (2020b)</td></tr>
</table></td><td>Significant and Unavoidable</td></tr>
</table>

Impact	Mitigation Measure(s)	Impact Finding
	If construction equipment would generate vibration levels exceeding acceptable levels as established by Caltrans, implementing agencies of the proposed 2022 RTP/SCS shall, or can and should, complete the following tasks: ▪ Prior to construction, survey the project site for vulnerable buildings, and complete geotechnical testing (preconstruction assessment of the existing subsurface conditions and structural integrity), for any older or historic buildings within 50 feet of pile driving. The testing shall be completed by a qualified geotechnical engineer and qualified historic preservation professional and/or structural engineer. ▪ Prepare and submit a report to the lead agency that contains the results of the geological testing. If recommended by the preconstruction report implementing agencies shall require ground vibration monitoring of nearby historic structures. Methods and technologies shall be based on the specific conditions at the construction site. The preconstruction assessment shall include a monitoring program to detect ground settlement or lateral movement of structures in the vicinity of pile-driving activities and identify corrective measures to be taken should monitored vibration levels indicate the potential for building damage. In the event of unacceptable ground movement with the potential to cause structural damage, all impact work shall cease, and corrective measures shall be implemented to minimize the risk to the subject, or adjacent, historic structure. ▪ To minimize disturbance withing 550 feet of pile-driving activities, implement "quiet" pile-driving technology, such as predrilling of piles and the use of more than one pile driver to shorten the duration of pile driving), where feasible, in consideration of geotechnical and structural requirements and conditions as defined as part of the geotechnical testing, if testing was feasible. ▪ Use cushion blocks to dampen noise from pile driving. ▪ Phase operations of construction equipment to avoid simultaneous vibration sources **N-3(b) Vibration Mitigation for Operation of Transportation Projects.** Where local vibration and groundborne noise standards do not apply, implementing agencies of proposed 2022 RTP/SCS projects shall comply with all applicable local vibration and groundborne noise standards, or in the absence of such local standards, comply with guidance provided by the FTA in Transit Noise and Vibration Impact Assessment (FTA 2018) to assess impacts to buildings and sensitive receptors and reduce vibration and groundborne noise. FTA recommended thresholds shall be used except in areas where local standards for groundborne noise and vibration have been established. Methods that can be implemented to reduce vibration and groundborne noise impacts include, but are not limited to: ▪ Bus and Truck Traffic ▫ Constructing of noise barriers ▫ Use noise reducing tires and wheel construction on bus wheels ▫ Use vehicle skirts (i.e., a partial enclosure around each wheel with absorptive treatment) on freight vehicle wheels	
Impact N-4. Land use projects envisioned by the 2022 RTP/SCS may place sensitive receptors in areas with noise	**N-4 Noise Mitigation for Land Uses.** If a land use project is located in an area with exterior ambient noise levels above local noise standards, the implementing agency shall ensure that a noise study is conducted to determine the existing exterior noise levels in the vicinity of the project. If the project would be impacted by ambient noise levels, feasible attenuation measures shall be used to reduce operational noise to meet acceptable standards. In addition, noise	Significant and Unavoidable

Impact	Mitigation Measure(s)	Impact Finding
levels in excess of standards established in the local general plan or noise ordinance. This impact would be significant and unavoidable.	insulation techniques shall be utilized to reduce indoor noise levels to thresholds set in applicable State and/or local standards. Such measures may include but are not limited to: dual-paned windows, solid core exterior doors with perimeter weather stripping, air conditioning system so that windows and doors may remain closed, and situating exterior doors away from roads. The noise study and determination of appropriate mitigation measures shall be completed during the project's individual environmental review.	
Transportation		
Impact T-1. transportation projects and land use projects envisioned by the proposed 2022 RTP/SCS would not conflict with any program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. This impact would be less than significant.	None required.	Less than Significant
Impact T-2. The proposed 2022 would result in an overall increase in regional VMT above baseline (2016) conditions. The proposed 2022 RTP/SCS would result in an increase in VMT per capita below the above baseline (2016) conditions. Regional VMT and VMT per capita impacts from implementation of the proposed 2022 RTP/SCS would be significant and unavoidable. The induced travel impact at the regional level would be less than significant.	**T-2(a) Regional VMT Reduction Programs.** Implementing agencies shall require implementation of VMT reduction strategies through TDM programs, impact fee programs, mitigation banks or exchange programs, in-lieu fee programs, and other land use project conditions that reduce VMT. Programs shall be designed to reduce VMT from existing land uses, where feasible, and from new discretionary residential or employment land use projects. The design of programs and project specific mitigation shall focus on VMT reduction strategies that increase travel choices and improve the comfort and convenience of sharing rides in private vehicles, using public transit, biking, or walking. Modifications may include but are not limited to: ▪ Provide car-sharing, vanpool, bike sharing, and ride-sharing programs ▪ Implement or provide access to commute reduction programs ▪ Provide a bus rapid transit system ▪ Improve pedestrian or bicycle networks, or transit service ▪ Provide transit passes ▪ Encourage telecommute programs ▪ Incorporate affordable housing into the project ▪ Increase density ▪ Increase mixed uses within the project area ▪ Incorporate improved pedestrian connections within the project/neighborhood ▪ Incentivize development in low VMT communities ▪ Incentivize housing near commercial and offices	Significant and Unavoidable

Impact	Mitigation Measure(s)	Impact Finding
	▪ Increase access to goods and services, such as groceries, schools, and daycare ▪ Incorporate neighborhood electric vehicle network ▪ Orient the project toward transit, bicycle, and pedestrian facilities ▪ Provide traffic calming ▪ Provide bicycle parking ▪ Limit parking ▪ Separate out parking costs ▪ Provide parking cash-out programs	
Impact T-3. Proposed transportation and land use projects implementing the proposed 2022 RTP/SCS would not substantially increase hazards due to geometric design features or incompatible uses. This impact would be less than significant.	None required.	Less than Significant
Impact T-4. Transportation and land use projects implementing the proposed 2022 RTP/SCS would not result in inadequate emergency vehicle access or interfere with an adopted emergency response plan or emergency evacuation plan. This impact would be less than significant.	None required.	Less than Significant
Tribal Cultural Resources		
Impact TCR-1. Implementation of proposed transportation improvements and future projects included in the land use scenario envisioned in the 2022 RTP/SCS has the potential to impact tribal cultural resources. Impacts	**TCR-1(a) Identified Tribal Cultural Resources Impact Minimization.** Implementing agencies shall, or can and should, comply with AB 52, which may require formal tribal consultation. If the implementing agency determines that a project may cause a substantial adverse change to a tribal cultural resource, they shall implement mitigation measures identified in the consultation process required under PRC Section 21080.3.2, or shall implement the following measures where feasible to avoid or minimize the project-specific significant adverse impacts: ▪ Avoidance and preservation of the resources in place, including, but not limited to: designing and building the project to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space to incorporate the resources with culturally appropriate protection and management criteria.	Less than Significant with Mitigation Incorporated

Impact	Mitigation Measure(s)	Impact Finding
would be less than significant with mitigation incorporated.	▪ Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following: ▫ Protecting the cultural character and integrity of the resource ▫ Protecting the traditional use of the resource ▫ Protecting the confidentiality of the resource ▪ Establishment of permanent conservation easements or other culturally appropriate property management criteria for the purposes of preserving or utilizing the resources or places. ▪ Native American monitoring by the appropriate tribe during soil disturbance for all projects in areas identified as sensitive for potential tribal cultural resources and/or in the vicinity (within 100 feet) of known tribal cultural resources. **TCR-1(b) Unanticipated Tribal Cultural Resources Impact Minimization.** If unanticipated potential tribal cultural resources are encountered during ground-disturbing activities, work in the immediate area must halt and the appropriate tribal representative(s), the implementing agency, and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service [NPS] 1983) shall be contacted immediately to evaluate the find. If, in consultation with the implementing agency, the archaeologist and/or tribal representative determines the discovery to be a tribal cultural resource and thus, significant under CEQA, a mitigation plan shall be prepared and implemented in accordance with state guidelines and in consultation with tribal representatives. If the resource cannot be avoided, a mitigation plan shall be developed to address tribal concerns.	
Wildfire		
Impact WF-1. Proposed transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would be located in or near an SRA or very high fire hazard severity zone, and significant risks of loss, injury, or death from wildfires or downstream flooding or landslides would occur. Impacts would be significant but mitigable.	**WF-1(a) Wildfire Risk Reduction.** If an individual transportation or land use project included in 2022 RTP/SCS is located within or less than two miles from an SRA or very high fire hazard severity zones, the implementing agency shall require appropriate mitigation to reduce the risk. Examples of mitigation to reduce risk of loss, injury or death from wildlife include, but are not limited to: ▪ Require the use of fire-resistant vegetation native to San Joaquin County and/or the local microclimate of the project site and discourage the use of fire-prone species especially nonnative, invasive species. ▪ Enforce defensible space regulations to keep overgrown and unmanaged vegetation, accumulations of trash and other flammable material away from structures. ▪ Provide public education about wildfire risk, fire prevention measures, and safety procedures and practices to allow for safe evacuation and/or options to shelter-in-place. ▪ Require adherence to the local hazard mitigation plan, as well as the local general plan policies and programs aimed at reducing the risk of wildfires through land use compatibility, training, sustainable development, brush management, public outreach, and service standards for fire departments. ▪ Ensure sufficient emergency water supply. ▪ Encourage the use of fire-resistant vegetation native to San Joaquin County and/or the local microclimate of the project site and discourage the use of fire-prone species especially non-native, invasive species. ▪ Require a fire safety plan be submitted to and approved by the local fire protection agency. The fire safety plan shall include all of the fire safety features incorporated into the project and the schedule for implementation of	Less than Significant with Mitigation Incorporated

Impact	Mitigation Measure(s)	Impact Finding
	the features. The local fire protection agency may require changes to the plan or may reject the plan if it does not adequately address fire hazards associated with the project as a whole or the individual phase of the project. ▪ Prohibit certain project construction activities with potential to ignite wildfires during red-flag warnings issued by the National Weather Service for the project site location. Example activities that should be prohibited during red-flag warnings include welding and grinding outside of enclosed buildings. ▪ Require fire extinguishers to be onsite during construction of projects. Fire extinguishers shall be maintained to function according to manufacturer specifications. Construction personnel shall receive training on the proper methods of using a fire extinguisher. ▪ Smoking and open fires shall be prohibited at individual transportation or land use projects sites included in 2022 RTP/SCS during construction and operations. A copy of the notification to all contractors regarding prohibiting smoking and burning shall be provided to the County. **WF-1(b) Fire Protection Plan.** Individual transportation or land use projects included in the 2022 RTP/SCS shall prepare a Fire Protection Plan that meets Fire Prevention Bureau of San Joaquin County requirements. The plan shall contain (but not be limited to) the following provisions: ▪ All construction equipment shall be equipped with appropriate spark arrestors and carry fire extinguishers. ▪ A fire watch with appropriate firefighting equipment shall be available at the Project site at all times when welding activities are taking place. Welding shall not occur when sustained winds exceed that set forth by the Fire Prevention Bureau of San Joaquin County unless a Fire Prevention Bureau of San Joaquin County -approved wind shield is on site. ▪ A vegetation management plan shall be prepared to address vegetation clearance around all Wind Turbine Generators (WTGs) and a regularly scheduled brush clearance of vegetation on and adjacent to all access roads, power lines, and other facilities. ▪ Operational fire water tanks shall be installed prior to construction. ▪ Provisions for fire/emergency services access if roadway blockage occurs due to large loads during construction and operation ▪ Cleared, maintained parking areas shall be designated; no parking shall be allowed in non-designated areas. ▪ The need for and/or use of dedicated repeaters for emergency services. ▪ Appropriate Hot work permits (such as cutting and welding permits) shall be obtained from the jurisdictional fire agency. ▪ Compliance with California PRC 4291, 4442, and 4443	

This page intentionally left blank.

1 Introduction

1.1 Statement of Purpose

This document is a Programmatic Environmental Impact Report (EIR) that identifies and describes potential environmental impacts associated with the 2022 Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) proposed by the San Joaquin Council of Governments (SJCOG). The 2022 RTP/SCS is an update of the 2018 RTP/SCS, which was adopted in 2018 following certification of a Programmatic EIR.

Section 21000 et seq. of the California Public Resources Code, commonly referred to as the California Environmental Quality Act of 1970 (CEQA), requires the evaluation of environmental impacts associated with discretionary planning programs or proposed development projects proposed. As such, this EIR is an informational document for use by SJCOG, other agencies and the general public in their consideration and evaluation of the environmental consequences of implementing the proposed 2022 RTP/SCS.

This introduction section of the EIR describes the following aspects of the 2022 RTP/SCS and the EIR: project background; purpose and legal authority; implementation issues and future environmental review; EIR background; applicable agencies involved in the project; EIR scope, content, and format; and the environmental review process under CEQA.

1.2 Project Background

The proposed project, the 2022 RTP/SCS, is a long-range comprehensive plan for the region's multi-modal transportation system. As a Metropolitan Planning Organization (MPO), preparing an RTP is one of SJCOG's primary statutory responsibilities under federal and state law. Implementation of an RTP is the mechanism used in California by both MPOs and Regional Transportation Planning Agencies (RTPAs) to conduct long-range planning (at least 20-years into the future) in their regions. SJCOG must adopt an updated RTP every four years, or more frequently, if the region is to receive federal and state transportation dollars for public transit, streets/roads, and bicycle and pedestrian improvements. SJCOG adopted the 2018 RTP/SCS in June 2018; it provides a long-range plan for transportation in San Joaquin County.

In 2008, California enacted the Sustainable Communities and Climate Protection Act, also known as Senate Bill 375 (SB 375), which requires MPOs to include a Sustainable Communities Strategy (SCS) element in their RTP updates. The 2014 RTP was the first SJCOG plan to include the SCS. The California Air Resources Board (CARB) provided greenhouse gas (GHG) reduction targets for the preparation of the 2018 RTP/SCS, setting the targets at a 5 percent per capita reduction by 2020 and 10 percent per capita reduction by 2035 from year 2005 levels. The 2018 RTP/SCS met those targets. On March 22, 2018, CARB adopted updated regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. SJCOG was assigned a target of a 16 percent reduction in GHG emissions from per capita passenger vehicles by 2035, relative to 2005 emission levels.

The 2022 RTP/SCS programs available transportation funding through the year 2046 and includes lists of programmed and planned transportation projects to improve the transportation system during the 2022-2046 planning period. Some projects in the 2018 RTP/SCS have since been

completed or begun construction. Transportation projects yet to be completed have been incorporated into the 2022 RTP/SCS, along with a few additional new projects.

1.3 Purpose and Legal Authority

This EIR has been prepared in compliance with the CEQA Statutes and Guidelines. In general, the purpose of an EIR is to (see *State CEQA Guidelines* Section 15121(a)):

a. Analyze the environmental effects of the adoption and implementation of the project;
b. Inform decision-makers, responsible and trustee agencies and members of the public as to the range of the project's environmental impacts;
c. Recommend a set of measures to mitigate significant adverse impacts; and
d. Analyze a range of reasonable alternatives to the proposed project.

As the lead agency for preparing this EIR, SJCOG will rely on the EIR analysis of environmental effects in their review and consideration of the proposed 2022 RTP/SCS prior to approval. Responsible Agencies will rely on the EIR analysis prior to approval of their respective projects under their jurisdiction.

As discussed in further detail below in Section 1.4.1, *CEQA Streamlining Opportunities*, SB 375 provides streamlining benefits for certain transit-oriented projects consistent with an adopted SCS. Pursuant to these provisions of SB 375, this EIR has also been prepared to allow qualifying projects to streamline their environmental review.

1.4 Implementation Issues and Future Environmental Review

The 2022 RTP/SCS contains transportation projects that will be implemented over time. Implementation of the 2022 RTP/SCS will follow a schedule based on the funding and demand for individual transportation projects and improvements. Implementation of the SCS component of the 2022 RTP/SCS will require the cooperation of SJCOG member agencies and municipalities in the SJCOG region.

Implementation of the projects addressed in the 2022 RTP/SCS must individually demonstrate compliance with the requirements of CEQA and/or NEPA (for projects requiring federal funding or approvals). As appropriate, individual projects may be required to prepare a project level analysis to fulfill CEQA and/or NEPA requirements. The lead agency responsible for reviewing these projects shall determine the level of review needed, and the scope of that analysis will depend on the specifics of the particular project. These projects may, however, use the discussion of impacts in this program EIR as a basis of their assessment of these regional or cumulative impacts. These projects may also be eligible for CEQA streamlining under SB 375, as explained further below.

This program EIR is a first-tier document that addresses the environmental impacts that may affect the SJCOG region from adoption and implementation of the 2022 RTP/SCS. "Tiering" generally refers to using the analysis of a broader environmental document that covers the general impacts of a program or larger-scale project so that subsequent environmental documents for a related individual project can be narrow and focused on unique or unanalyzed issues. CEQA encourages the use of tiering to reduce the time and excessive paperwork involved in the review process by

eliminating repetitive analyses of issues addressed in the program EIR (CEQA Guidelines Section 15168). SB 375 enables certain qualifying projects to tier off the SCS or alternative planning strategy developed to meet California's climate change goals. Tiered documents may consist of initial studies or focused EIRs that may incorporate by reference portions of the program EIR from which they are tiered. If the potential environmental effects of subsequent actions are consistent with and adequately addressed by a certified program EIR, additional environmental analysis may be unnecessary.

1.4.1 Streamlining Under SB 375

SB 375 provides streamlining benefits for Transit Priority Projects (TPP) and certain mixed-use projects. (See California Public Resources Code [PRC] Sections 21155 et seq.) For details, see the Governor's Office of Planning and Research's flow charts on SB 375 streamlining (Governor's Office of Planning and Research 2011). A TPP is a project that meets all of the criteria summarized below. For the purposes of this EIR, geographic areas that meet the TPP requirements are referred to as Transit Priority Areas (TPAs).

- Consistent with the general land use designation, density, building intensity and applicable policies specified for the project area in the SCS;
- Located within half a mile of a major transit stop or high-quality transit corridor;
- Comprised of at least 50 percent residential use based on total building square footage, or as little as 26 percent residential use if the project has a floor area ratio of not less than 0.75; and
- Built out with a minimum of 20 dwelling units per acre (PRC § 21155).

For the purposes of this EIR, geographic areas that meet the TPP requirements are referred to as TPAs. One of three potential streamlining benefits may apply to a TPP pursuant to SB 375, as described below.

First, TPPs that meet a detailed criteria list set forth in PRC Section 21155.1 are termed Sustainable Communities Projects and are statutorily exempt from CEQA. Due to the extensive list of criteria that must be met to achieve this exemption, the exemption may only be available in limited circumstances.

Second, a TPP that does not qualify for the statutory exemption may be eligible to comply with CEQA using a Sustainable Communities Environmental Assessment (SCEA). An SCEA is similar to a streamlined negative declaration or mitigated negative declaration that requires a 30-day public review period (rather than the otherwise available 20-day public review period). In addition, unlike a negative declaration or mitigated negative declaration, a lead agency's decision to approve a TPP based on an SCEA is reviewed, if challenged, by a court under the substantial evidence standard (PRC Section 21155.2(b)(7)).

Third, a TPP that will result in one or more significant impacts after mitigation may be reviewed using a tiered TPP EIR as established by PRC Section 21155.2(c). A tiered TPP EIR is only required to address the significant or potentially significant effects of the TPP on the environment and is not required to include a discussion of (1) growth inducing impacts, (2) any project specific or cumulative impacts from cars and light duty truck trips generated by the project on global warming or the regional transportation network, (3) cumulative effects that have been adequately addressed and mitigated in prior applicable certified EIRs, (4) off-site alternatives, or (5) a reduced density alternative to address effects of car and light truck trips generated by the TPP (PRC Sections 21155.2 (c), 21159.28(a) and (b)).

In addition to the benefits provided for TPPs, SB 375 provides streamlining benefits for residential or mixed-use residential projects, as defined in PRC Section 21159.28(d), that are consistent with the use designation, density, building intensity and applicable policies specified for the project area in the SCS but do not meet the criteria for TPPs. Projects eligible for streamlining must incorporate mitigation measures required by an applicable prior environmental document, such as this EIR after it is certified by SJCOG.

Projects that qualify to use the SB 375 CEQA streamlining benefits would still need to obtain discretionary permits or other approvals from the lead agency and the local jurisdiction, in accordance with local codes and procedures, including any agreements related to zoning, design review, use permits and other local code requirements. The streamlining only applies to the CEQA processing of a project.

1.4.2 Streamlining Under SB 226

In 2011, the legislature enacted SB 226 to establish additional streamlining benefits applicable to infill projects that are consistent with the requirements set forth in *State CEQA Guidelines* section 15183.3 (PRC Sections 21094.5 (c), 21094.5.5).

Unlike the CEQA streamlining benefits established by SB 375, the benefits created by SB 226 may apply to non-residential projects including qualifying commercial, retail, transit station, school, or public office building projects (*State CEQA Guidelines*, Section 15183.3 (f)(1)).

1.4.3 Streamlining Under SB 743

SB 743 (2013) (PRC Section 21099 and 21555.4) created an exemption from CEQA for certain residential, employment center and mixed-use development projects that are consistent with a Specific Plan (see Public Resources Code Section 21155.4.) (A Specific Plan implements a General Plan within a smaller geographic area, such as a downtown core or along a transit corridor; see Government Code Section 65450 et seq.). The exemption applies if a project meets all of the following criteria:

a. It is a residential, employment, or mixed-use project and is located within a transit priority area;
b. The project is consistent with a specific plan for which an environmental impact report was certified; and
c. It is consistent with an adopted SCS or alternative planning strategy.

The exemption cannot be applied if circumstances requiring preparation of a Subsequent or Supplemental EIR occur, for example if the project would cause new or worse significant environmental impacts compared to what was analyzed in the environmental impact report for the specific plan.

SB 743 also specifies that aesthetic and parking impacts of residential, mixed use residential, or employment center uses on infill sites within a TPA shall not be considered significant effects on the environment (see Public Resources Code Section 21099(d).)

1.4.4 Other Tiering Opportunities

Finally, for all other types of projects proposed to be carried out or approved by a lead agency within the region, the lead agency may utilize this EIR for the purposes of other allowed CEQA

tiering (PRC Sections 21068.5, 21093-21094, *State CEQA Guidelines* 15152, 15385). Tiering is the process by which general matters and environmental effects in an EIR prepared for a policy, plan, program or ordinance are relied upon by a narrower second-tier or site specific EIR (PRC Section 21068.5). Moreover, by tiering from this EIR (if certified by SJCOG), a later tiered EIR would not be required to examine effects that (1) were mitigated or avoided in this EIR, (2) were examined at a sufficient level of detail in this EIR to enable those effects to be mitigated or avoided by site specific revisions, the imposition of conditions, or by other means in connection with the approval of the later project (PRC Section 21094).

1.5 Environmental Impact Report Background

In compliance with the *CEQA Guidelines* (Section 15063), SJCOG, as the Lead Agency responsible for 2022 RTP/SCS, solicited preliminary public agency comments on the project through distribution of a Notice of Preparation (NOP) and receipt of public comments during a scoping meeting held virtually on January 13, 2021, from 12:00 p.m. to 1:00 p.m.

The NOP was distributed to affected agencies and the public for the required 30-day period from December 18, 2020 to January 27, 2021. Table 1-1 summarizes the issues relevant to the EIR that were identified in the NOP comments received (six agencies/individuals) and the EIR sections where the issues are addressed. The NOP and NOP comments and letters received are included in Appendix A of this EIR.

Table 1-1 NOP Comments and EIR Response

Comment/Request	How and Where it was Addressed
California Department of Fish and Wildlife	
CDFW recommends that the EIR provide baseline habitat assessments for special-status plant, fish and wildlife species located and potentially located within the project area and surrounding lands, including all rare, threatened, or endangered species.	Please refer to Section 4.3, *Biological Resources*, of the EIR for a discussion of potential impacts addressed at a programmatic level, including any potential conflict with existing conditions, regulations, or requirements.
CDFW recommends that prior to project implementation, including pre-construction, surveys be conducted for special-status species with potential to occur, following recommended survey protocols if available.	The EIR includes a programmatic discussion of potential project impacts and includes mitigation measures related to species specific surveying requirements. Please refer to Section 4.3, *Biological Resources*, of the EIR
CDFW recommends that the Project proponent seek appropriate take authorization under the California Endangered Species Act (CESA) prior to implementing the Project. In addition, CDFW requests biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA Incidental Take Permit (ITP).	Please refer to Section 4.3, *Biological Resources*, of the EIR for a discussion of potential impacts and mitigation measures addressed at a programmatic level, including impacts related to CESA.
CDFW states that protected species such as golden eagle, white-tailed kite, greater sandhill crane, and California black rail may not be taken or possessed at any time (Fish and Game Code § 3511). CDFW recommends that the EIR should include measures to ensure complete take avoidance of these fully protected species.	Please refer to Section 4.3, *Biological Resources*, of the EIR for a discussion of potential impacts and mitigation measures to these species, addressed at a programmatic level.
CDFW requests the EIR should fully identify the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the Lake and Streambed Alteration (LSA) Agreement.	The EIR includes a discussion of potential impacts to wetland and riparian resources in Section 4.3, *Biological Resources*.

Comment/Request	How and Where it was Addressed
CDFW requests the EIR identify reasonably foreseeable future projects in the project vicinity, disclose any cumulative impacts associated with these projects, determine the significance of each cumulative impact, and assess the significance of the project's contribution to the impact.	The EIR includes a discussion of potential direct, indirect, and cumulative biological resource impacts in Section 4.3, *Biological Resources*.
CDFW anticipates that the Project will have an impact on fish and/or wildlife, and assessment of filing fees is necessary	SJCOG, as Lead Agency, will be required to pay any necessary filing fees to CDFW, as applicable.
Native American Heritage Commission (NAHC)	
The NAHC states that the project is subject to the requirements and provisions under Assembly Bill (AB 52) for tribal cultural resources. The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of the proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources.	The EIR includes a discussion of consultation efforts with tribes in the area and potential project impacts in Section 4.12, *Tribal Cultural Resources*.
San Joaquin Regional Transit District	
The District requests that the EIR include an analysis and discussion pertaining to any potential impacts on San Joaquin RTD's current transit system including the following: safety; security; bus, bus rapid transit, intercity, and commuter services; transit stations; and accessibility.	The EIR includes a discussion of these impacts in Section 4.11, *Transportation*.
The District requests that the EIR include a discussion of equity pertaining to all modes of transportation and analyze any negative impacts concerning disproportionate impacts on communities.	Please refer to Chapter 5 and Appendix P of the RTP/SCS, for a discussion of identified communities of concern and impacts of the 2022 RTP/SCS on low-income populations, minority individuals and populations, and low mobility populations.
The District requests that all existing and planned intra and inter-county transportation systems, including rail (such as Altamont Corridor Express (ACE)) and express bus services such as San Joaquin RTD's Commuter Bus service should be evaluated for impacts pertaining to public access and service connections to important destinations for the travelling public.	The EIR includes a discussion of impacts to active transportation in Section 4.11, *Transportation*.
The District requests that the EIR discuss future highway capacity projects, such as the I-205 managed lanes project, and include potential impacts to regional transit and opportunities for express bus lanes.	The EIR includes a list of proposed transportation projects in Section 2.0, *Project Description* and a discussion of transportation related impacts in Section 4.11, *Transportation*.
Delta Protection Commission	
The Delta Protection Commission requests that the EIR consider the Commission's Land Use and Resource Management Plan and its policies when assessing the project's consistency with applicable land use plans, policies, and regulations and to discuss the Delta Trail in the recreation and transportation setting sections.	The EIR includes a discussion of applicable land use plans, policies, and regulations Section 4.9, *Land Use and Planning.* In addition, the EIR includes a discussion of impacts to recreational facilities in Section 4.14*, Effects Considered to be Less than Significant*.
Delta Stewardship Council	
The Delta Stewardship Council requests consultation as part of the process in developing the RTP/SCS.	This comment pertains to the preparation of the RTP/SCS and does not relate to the EIR. The Delta Stewardship Council will be afforded the opportunity to comment on the EIR during public review as required under the CEQA process.

Comment/Request	How and Where it was Addressed
The Delta Stewardship Council requests that the EIR discuss the project's consistency with the Delta Plan.	The EIR includes a discussion of applicable land use plans, policies, and regulations Section 4.9, *Land Use and Planning.*
Marian Rawlins	
The commenter requests that the EIR includes a discussion regarding the environmental issues of urban sprawl on rural landowners in the City of Manteca.	The EIR includes a programmatic analysis of impacts to visual resources in Section 4.1, *Aesthetics*, land use and planning issues in Section 4.9, *Land Use and Planning*, and transportation related impacts under the purview of CEQA in Section 4.11, *Transportation.*
NOP Scoping Meeting Comments	
Commenter requested information on transit-oriented development.	The EIR includes a discussion of the type of transit-oriented development proposed in Section 2.0, *Project Description*.
Commenter requested information regarding identification of environmental justice communities and potential environmental justice impacts.	Please refer to chapter 5 and Appendix P of the RTP/SCS, for a discussion of identified communities of concern and impacts of the 2022 RTP/SCS on low-income populations, minority individuals and populations, and low mobility populations.

1.6 Lead, Responsible, and Trustee Agencies

The *CEQA Guidelines* require the identification of "lead," "responsible," and "trustee" agencies. SJCOG is the "lead agency" for the proposed project because it has the principal responsibility for approving the project.

A "responsible agency" is a public agency other than the "lead agency" that has discretionary approval authority over certain components of a project (the *State CEQA Guidelines* define a public agency as a State or local agency, but specifically exclude federal agencies from the definition). A "trustee agency" refers to a State agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California (for example, the California Department of Fish and Wildlife). While no Responsible Agencies or Trustee Agencies are responsible for approvals associated with the adoption of the 2022 RTP/SCS, implementation of projects identified in the 2022 RTP/SCS will require permits and approvals from Lead, Trustee, and Responsible Agencies, which may include the following:

- County of San Joaquin
- City of Escalon
- City of Lathrop
- City of Lodi
- City of Manteca
- City of Ripon
- City of Stockton
- City of Tracy
- California Transportation Commission
- California Department of Transportation
- California Department of Fish and Wildlife
- California Department of Conservation
- Regional Water Quality Control Board
- Native American Heritage Commission
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service

- San Joaquin Valley Air Pollution Control District
- Delta Stewardship Council

1.7 EIR Scope, Content, and Format

This document includes discussions of environmental impacts related to several issue areas. The analysis of environmental impacts identifies impacts by category: significant and unavoidable (Class I), less than significant with mitigation incorporated (Class II), less than significant (Class III), and beneficial (Class IV). It proposes mitigation measures, where feasible, for identified significant environmental impacts. Environmental topic areas that are addressed in this EIR include:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions/Climate Change
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Transportation and Circulation
- Tribal Cultural Resources
- Wildfire

This EIR has been organized into seven sections, which include:

1. **Introduction.** Provides the statement of purpose, project background, and information about the EIR content and format.
2. **Project Description.** Identifies the project applicant, presents and discusses the project objectives, project locations and specific project characteristics.
3. **Environmental Setting.** Provides a description of the existing physical setting of the SJCOG region, an overview of the progress in implementing the 2022 RTP/SCS, a description of the regional transportation system, and discusses the EIR baseline and approach to direct and cumulative analyses.
4. **Analysis of Environmental Issues.** Describes existing conditions found in the project area and assesses potential environmental impacts that may be generated by implementing the proposed project and cumulative development in San Joaquin County. These potential project impacts are compared to "thresholds of significance" to determine the nature and severity of the direct and indirect impacts. Mitigation measures (intended to reduce adverse, significant impacts below threshold levels) are proposed where feasible. Impacts that cannot be eliminated or mitigated to less-than-significant levels are also identified.
5. **Other CEQA-Required Discussions.** Identifies the spatial, economic, or population growth impacts that may result from implementation of the proposed project, as well as long-term effects of the project and significant irreversible environmental changes.
6. **Alternatives.** Presents and assesses the potential environmental impacts of three alternatives (including one no project) analyzed in addition to implementation of the 2022 RTP/SCS.
7. **References/Preparers.** Lists all published materials, federal, State, and local agencies, and other organizations and individuals consulted during the preparation of this EIR. It also lists the EIR preparers.

1.8 Environmental Review Process

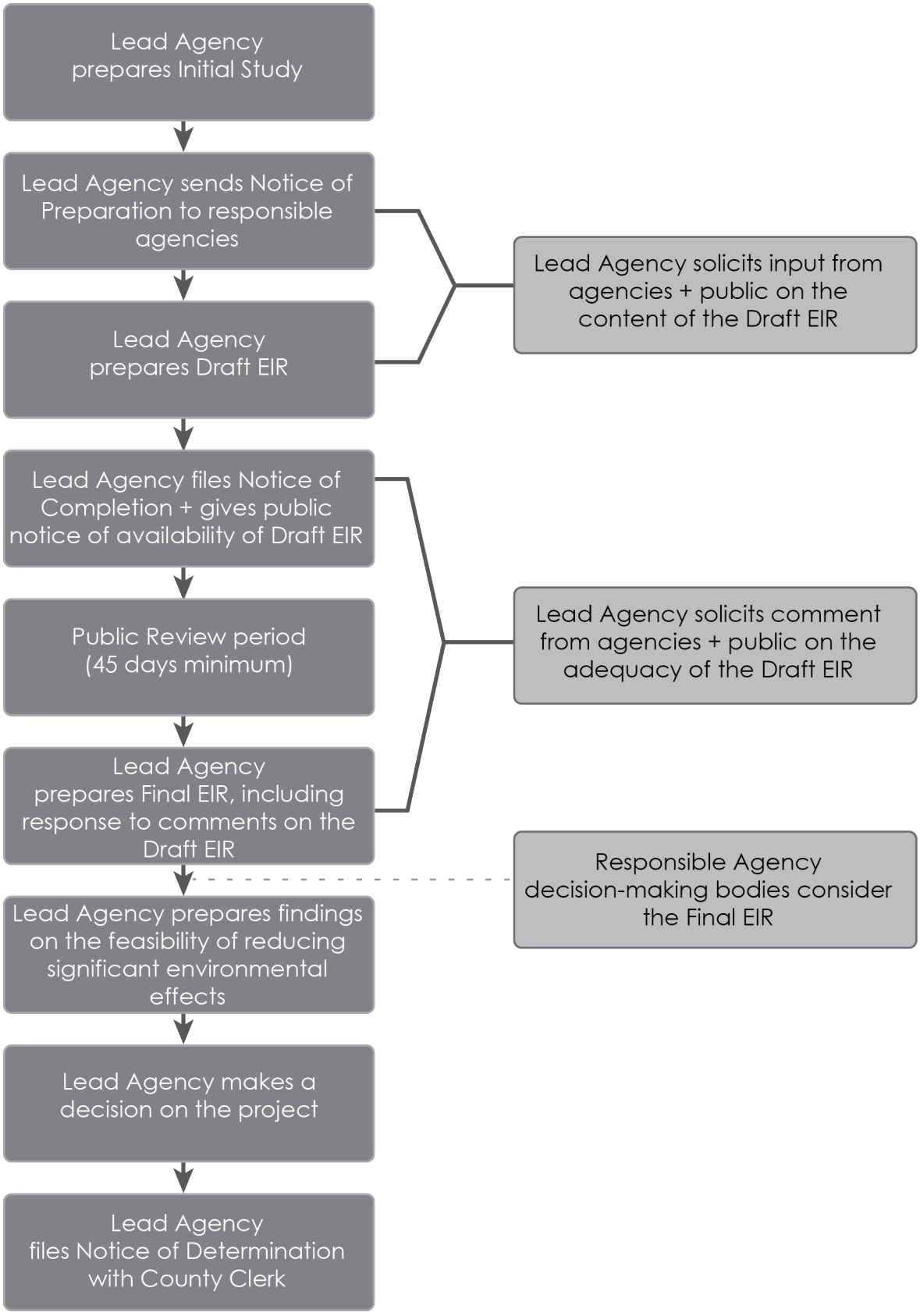
The environmental impact review process, as required under CEQA, is summarized below and illustrated in Figure 1-1. The steps are presented in sequential order.

1. **Notice of Preparation (NOP)**. After deciding that an EIR is required, the lead agency (SJCOG) must file a NOP soliciting input on the EIR scope to the State Clearinghouse, other concerned agencies, and parties previously requesting notice in writing (*CEQA Guidelines* Section 15082; Public Resources Code Section 21092.2). The NOP must be posted in the County Clerk's office for 30 days. SJCOG filed the NOP with the County Clerk's office on December 15, 2021.
2. **Draft EIR Prepared.** The Draft EIR must contain: a) table of contents or index; b) summary; c) project description; d) environmental setting; e) discussion of significant impacts (direct, indirect, cumulative, growth-inducing and unavoidable impacts); f) a discussion of alternatives; g) mitigation measures; and h) discussion of irreversible changes.
3. **Notice of Completion (NOC)/Notice of Availability (NOA).** The lead agency must file an NOC with the State Clearinghouse when it completes a Draft EIR and prepare and provide a NOA of a Draft EIR. The lead agency must place the NOA in the County Clerk's office for 30 days (Public Resources Code Section 21092), post on their website along with the DEIR, and send a copy of the notice to anyone requesting it (*CEQA Guidelines* Section 15087). Additionally, public notice of Draft EIR availability must be given through at least one of the following procedures: a) publication in a newspaper of general circulation; b) posting on and off the project site; and c) direct mailing to owners and occupants of contiguous properties. The lead agency must solicit input from other agencies and the public and respond in writing to all comments received (Public Resources Code Sections 21104 and 21253). The minimum public review period for a Draft EIR is 30 days. When a Draft EIR is sent to the State Clearinghouse for review, the public review period must be 45 days unless the State Clearinghouse approves a shorter period (Public Resources Code 21091).
4. **Final EIR.** A Final EIR must include: a) the Draft EIR; b) copies of comments received during public review; c) list of persons and entities commenting; and d) responses to comments.
5. **Certification of Final EIR.** Prior to making a decision on a proposed project, the lead agency must certify that: a) the Final EIR has been completed in compliance with CEQA; b) the Final EIR was presented to the decision-making body of the lead agency; and c) the decision making body reviewed and considered the information in the Final EIR prior to approving a project (*CEQA Guidelines* Section 15090).
6. **Lead Agency Project Decision.** The lead agency may a) disapprove the project because of its significant environmental effects; b) require changes to the project to reduce or avoid significant environmental effects; or c) approve the project despite its significant environmental effects, if the proper findings and statement of overriding considerations are adopted (*CEQA Guidelines* Sections 15042 and 15043).
7. **Findings/Statement of Overriding Considerations**. For each significant impact of the project identified in the EIR, the lead agency must find, based on substantial evidence, that either: a) the project has been changed to avoid or substantially reduce the magnitude of the impact; b) changes to the project are within another agency's jurisdiction and such changes have or should be adopted; or c) specific economic, social, or other considerations make the mitigation measures or project alternatives infeasible (*CEQA Guidelines* Section 15091). If an agency approves a project with unavoidable significant environmental effects, it must prepare a written

Statement of Overriding Considerations that sets forth the specific social, economic, or other reasons supporting the agency's decision.

8. **Mitigation Monitoring Reporting Program.** When the lead agency makes findings on significant effects identified in the EIR, it must adopt a reporting or monitoring program for mitigation measures that were adopted or made conditions of project approval to mitigate significant effects.
9. **Notice of Determination (NOD).** The lead agency must file a NOD after deciding to approve a project for which an EIR is prepared (*CEQA Guidelines* Section 15094). A local agency must file the NOD with the County Clerk. The NOD must be posted for 30 days and sent to anyone previously requesting notice. Posting of the NOD starts a 30-day statute of limitations on CEQA legal challenges (Public Resources Code Section 21167[c]).

Figure 1-1 Environmental Review Process



This page intentionally left blank.

2 Project Description

This section describes the proposed project (2022 RTP/SCS), including the project applicant, project objectives, the project location, major project characteristics, and discretionary actions needed for approval.

2.1 Lead Agency

San Joaquin County of Governments
555 East Weber Avenue
Stockton, California 95202
Contact: Timothy Kohaya, Senior Regional Planner

2.2 Project Objectives

General Legislative Requirements

The San Joaquin Council of Governments (SJCOG), as both the federally-designated metropolitan planning organization (MPO) and the state-designated regional transportation planning agency (RTPA) for San Joaquin County, is required by both federal and state law to prepare a long-range (at least 20-year) transportation planning document known as a Regional Transportation Plan (RTP). The RTP is an action-oriented document used to achieve a coordinated and balanced regional transportation system.

SJCOG also has the responsibility to prepare a Sustainable Communities Strategy (SCS) as part of the RTP, pursuant to the requirements of the Sustainable Communities and Climate Protection Act (Senate Bill [SB] 375) as adopted in 2008 (discussed further below). The SCS sets forth a forecasted development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, is intended to reduce greenhouse gas (GHG) emissions from passenger vehicles and light trucks to achieve the regional GHG reduction targets set by the California Air Resources Board (CARB).

The California Transportation Commission's (CTC) document *2017 California Regional Transportation Plan Guidelines* serves as the guidance for RTP development. Under both federal and State law, an MPO must update its RTP every four years when in a federally designated air quality non-attainment area.

Sustainable Communities & Climate Protection Act Requirements (SB 375) Requirements

The Sustainable Communities and Climate Protection Act, also known as SB 375 (codified at California Government Code §§ 14522.1, 14522.2, 65080.01, 65080, 65400, 65583, 65584.01, 65584.02, 65584.04, 65587, 65588; Public Resources Code §§2161.3, 21155, 21159.28), is a law passed in 2008 by the California legislature that requires each MPO to demonstrate, through the development of an SCS, how its region will integrate transportation, housing, and land use planning to meet the greenhouse gas (GHG) reduction targets set by the State. In addition to creating requirements for MPOs, it also creates requirements for the CTC and CARB. Some of the requirements include the following:

- The CTC must maintain guidelines for the travel demand models that MPOs develop for use in the preparation of their RTPs;
- CARB must develop regional GHG emission reduction targets for automobiles and light trucks for 2020 and 2035 by September 30, 2010 (completed);
- Each MPO must prepare an SCS as part of its RTP to demonstrate how it will meet the regional GHG targets. If an SCS cannot achieve the regional GHG target, the MPO must prepare an Alternative Planning Strategy (APS) showing how it would achieve the targets with alternative development patterns, infrastructure, or transportation measures and policies;
- Each MPO must adopt a public participation plan for development of the SCS that includes informational meetings, workshops, public hearings, consultation, and other outreach efforts (completed);
- Each MPO must prepare and circulate a draft SCS at least 55 days before it adopts a final RTP;
- After adoption, each MPO must submit its SCS to CARB for review; and
- CARB must review each SCS to determine whether, if implemented, it would meet the GHG targets. CARB must complete its review within 60 days.

CARB sets targets for the SJCOG region to maintain or reduce greenhouse gas emissions in 2020 and in 2035. These targets apply to the SJCOG region as a whole for all on-road light-duty trucks and passenger vehicles emissions, and not to individual cities or sub-regions. On March 22, 2018, CARB adopted updated regional targets for reducing GHG emissions to 2005 levels by 2020 and 2035. SJCOG was assigned a target of a 16 percent reduction in GHG emissions from per capita passenger vehicles by 2035, relative to 2005 emission levels. Emissions modeling for the RTP/SCS incorporates a base year of 2005 for SB 375 GHG emission reduction targets. The 2022 RTP/SCS includes the years for which the regional targets are required (base year and 2035) and the RTP includes additional scenario years (2030 and 2046) to comply with federal law. In addition, the RTP includes estimates of CO_2 per capita for each of the scenario years. As discussed in Section 4.7, *Greenhouse Gas Emissions*.

SB 375 specifically states that local governments retain their autonomy to plan local general plan policies and land uses. The 2022 RTP/SCS provides a regional policy foundation that local governments may build upon, if they so choose. The 2022 RTP/SCS includes and accommodates the quantitative growth projections for the region. SB 375 also requires that the RTP's forecasted development pattern for the region be consistent with the eight-year regional housing needs as allocated to member jurisdictions through the Regional Housing Needs Allocation (RHNA) process under state housing law. RHNA is statutorily exempt from CEQA.

In addition, this EIR lays the groundwork for the streamlined review of qualifying development projects within Transit Priority Areas.[1] Qualifying projects that meet statutory criteria and consistent with the 2022 RTP/SCS are eligible for streamlined environmental review pursuant to CEQA under SB 375 and other laws.

Fixing America's Surface Transportation Act (FAST Act)

The most recent federal transportation legislation, Fixing America's Surface Transportation (FAST) Act builds on the changes made by MAP-21, and was enacted in 2015. The Moving Ahead for Progress in the 21st Century Act (MAP-21), enacted in 2012, made a number of reforms to the

[1] A Transit Priority Area is an area within ½-mile of high-quality transit: a rail stop or a bus corridor that provides or will provide at least 15-minute frequency service during peak hours by the year 2035.

metropolitan and statewide transportation planning processes, including incorporating performance goals, measures, and targets into the process of identifying needed transportation improvements and project selection. The FAST Act includes provisions to support and enhance these reforms. Public involvement remains a hallmark of the planning process.

The FAST Act continues to require a long-range plan and a short-term transportation improvement program (TIP), with the long-range statewide and metropolitan plans now required to include facilities that support intercity transportation, including intercity buses. The statewide and metropolitan long-range plans must describe the performance measures and targets that states and MPOs use in assessing system performance and progress in achieving the performance targets. Additionally, the FAST Act requires the planning process to consider projects/strategies to improve the resilience and reliability of the transportation system, address stormwater mitigation, and enhance travel and tourism.

Finally, in an effort to engage all sectors and users of the transportation network, the FAST Act requires that the planning process include public ports and private transportation providers, and further encourages MPOs to consult during this process with officials of other types of planning activities, including tourism and natural disaster risk reduction. MAP-21 and the FAST Act also change criteria for MPO officials to provide transit provider representatives with equal authority and allow the representative to also serve as the representative of a local municipality.

Through the RTP development process, the FAST Act encourages SJCOG to:

- Consult with officials responsible for other types of planning activities that are affected by transportation in the area (including State and local planned growth, economic development, environmental protection, airport operations, and freight movements) or to coordinate its planning process, to the maximum extent practicable, with such planning activities.[2]

Specifically, the FAST Act requires that the RTP planning process:

Provide for consideration of projects and strategies that will:

a) Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
b) Increase the safety of the transportation system for motorized and non-motorized users;
c) Increase the security of the transportation system for motorized and non-motorized users;
d) Increase the accessibility and mobility of people and for freight;
e) Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
f) Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
g) Promote efficient system management and operation;
h) Emphasize the preservation of the existing transportation system;
i) Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and
j) Enhance travel and tourism. 3

[2] 23 U.S.C. §134(g)(3)(A).
[3] 23 U.S.C. §134(h)(1).

Planning Final Rule – FAST Act

On May 27, 2016, the Statewide and Nonmetropolitan Transportation Planning and Metropolitan Transportation Planning Final Rule was issued, with an effective date of June 27, 2016, for Title 23 CFR Parts 450 and 771 and Title 49 CFR Part 613. This final rule states, "On or after May 27, 2018, an RTPA may not adopt an RTP that has not been developed according to the provisions of MAP-21/FAST Act as specified in the Planning Final Rule." This rule applies to the 2022 RTP/SCS.

Environmental Justice

SJCOG is required to address social equity and environmental justice in the RTP. The legal basis for environmental justice stems from the Civil Rights Act of 1964, along with Executive Order 12898 (February 1994), which states that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." SJCOG must evaluate how the 2022 RTP/SCS might impact minority and low-income populations and must ensure that the 2022 RTP/SCS does not have a disproportionate adverse impact on such populations.

In addition, per 23 C.F.R. Section 450.316(a)(1)(vii), the participation plan that SJCOG must develop and use must describe explicit procedures, strategies, and desired outcomes for "[s]eeking out and considering the needs of those traditionally underserved by existing transportation systems, such as low-income and minority households, who may face challenges accessing employment and other services."

Regional Transportation Plans

As noted, the procedures for developing RTPs are provided in the CTC's Regional Transportation Plan Guidelines (2017). The guidelines identify the purpose of an RTP to be as follows:

- Providing an assessment of the current modes of transportation and the potential of new travel options within the region;
- Projecting/estimating the future needs for travel and goods movement;
- Identification and documentation of specific actions necessary to address regional mobility and accessibility needs;
- Identification of guidance and documentation of public policy decisions by local, regional, state and federal officials regarding transportation expenditures and financing and future growth patterns;
- Identification of needed transportation improvements, in sufficient detail, to serve as a foundation for the: (a) Development of the Federal Transportation Improvement Program (FTIP), and the State Transportation Improvement Program (STIP), (b) Facilitation of the National Environmental Policy Act (NEPA)/404 integration process, and (c) Identification of project purpose and need;
- Employing performance measures that demonstrate the effectiveness of the system of transportation improvement projects in meeting the intended goals;
- Promotion of consistency between the CTP, the regional transportation plan and other plans developed by cities, counties, districts, California Tribal Governments, and state and federal agencies in responding to statewide and interregional transportation issues and needs;

- Providing a forum for: (1) participation and cooperation and (2) facilitation of partnerships that reconcile transportation issues which transcend regional boundaries; and
- Involving community-based organizations as part of the public, Federal, State and local agencies, California Tribal Governments, as well as local elected officials, early in the transportation planning process so as to include them in discussions and decisions on the social, economic, air quality and environmental issues related to transportation.

RTPs must include long-term horizons (at least 20 years) that reflect regional needs, identify regional transportation issues/problems, and develop and evaluate solutions that incorporate all modes of travel. RTPs must also recommend a comprehensive approach that provides direction for programming decisions to meet identified regional transportation needs. RTPs must also be fully consistent with requirements of the FAST Act and other federal regulations, including conformity with the 1990 Clean Air Act Amendments and consistency with the Federal Transportation Improvement Program (FTIP).

In addition, Government Code §§ 65050, 65400, 65584.01-04, 65587, 65588 and Public Resources Code §21155 were amended in January 2009 when SB 375 became law, requiring coordinated planning between regional land use and transportation plans to increase efficiency and reduce GHG emissions.

Local Goals and Objectives

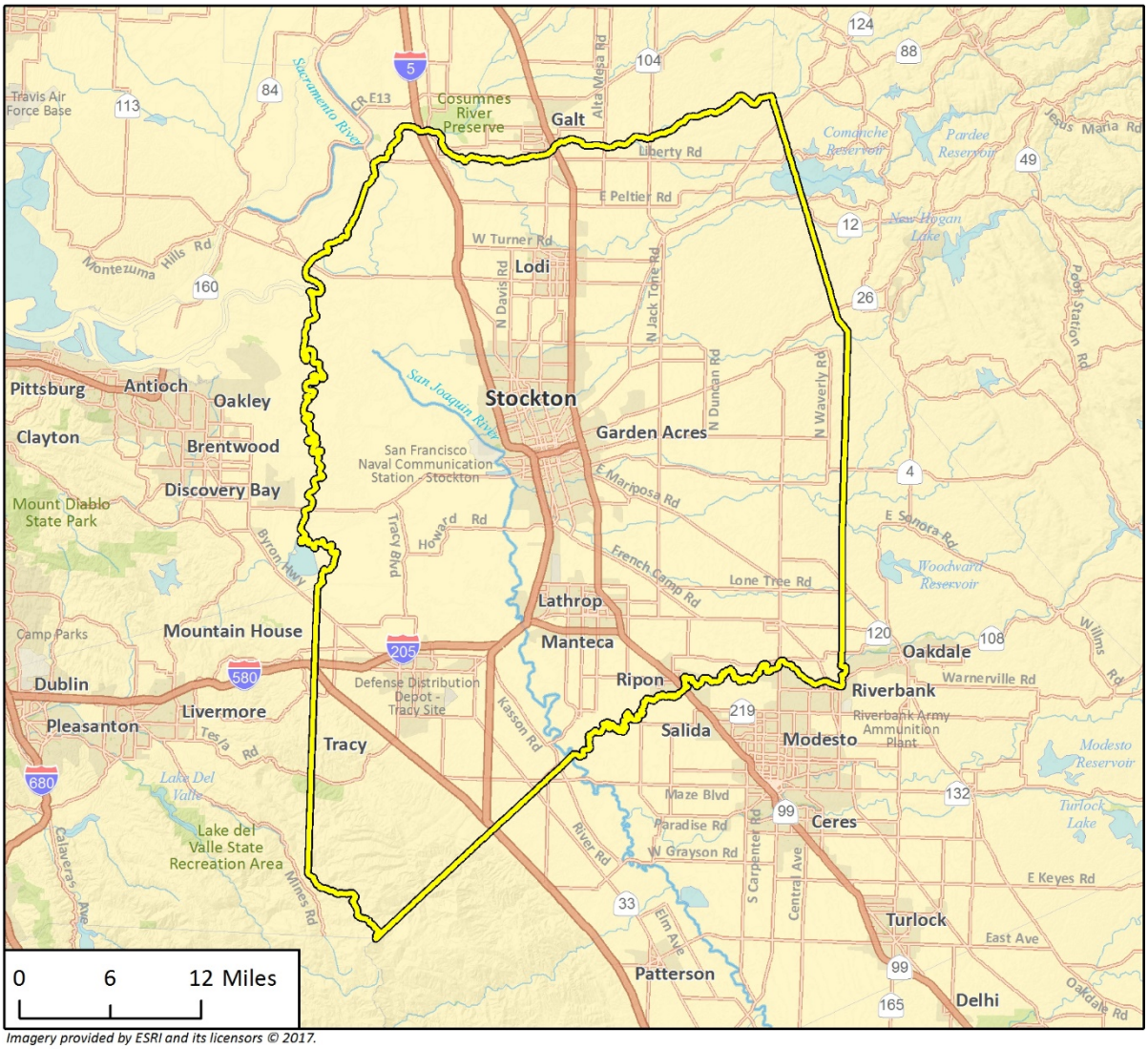
The 2022 RTP/SCS includes mobility as an important component and incorporates an emphasis on sustainability and integrated planning. The Plan contains projects, policies, and strategies to achieve a wide range of positive outcomes. It identifies reasonably available sources of funding for transportation. The 2022 RTP/SCS is a plan for improving the quality of life for residents of San Joaquin County by planning for wise transportation investments and informed land use choices. The plan aims to achieve variety and efficiency in travel choices, as well as a safe, secure, and efficient transportation system that would provide improved mobility and access. It includes strategies to generally improve air quality, improve health, and reduce greenhouse gas emissions consistent with SB 375 requirements. The plan achieves its overall objectives by combining transportation investment and policies with integrated land use strategies designed to reduce per capita vehicle miles traveled (VMT) and emissions. These land use strategies include:

- Focusing new growth and development in areas well served by transit,
- Promoting a better fit between jobs and housing,
- Redirecting future housing growth toward more compact unit types, and
- Promoting a mix of uses and neighborhood design that enables more walk and bike trips.

2.3 Project Location

As discussed in detail in Section 3.0, *Environmental Setting*, the 2022 RTP/SCS covers the entire area of San Joaquin County and includes the cities of Stockton, Tracy, Lodi, Manteca, Lathrop, Ripon, and Escalon, as well as unincorporated communities in the county (see Figure 2-1). Capital improvement transportation projects, identified in the 2022 RTP/SCS, are located on State highways, County roads, and locally owned streets, as well as on transit district property and public utility lands. These projects are shown in Figure 2-1 and Figure 2-2 through Figure 2-9, also described and listed in Table 2-1.

Figure 2-1 SJCOG Regional Location



Imagery provided by ESRI and its licensors © 2017.

San Joaquin County

N

Fig 2 Regional Location

2.4 Project Characteristics

The 2022 RTP/SCS is a technical update to the 2018 RTP/SCS which was adopted in 2018. The 2022 RTP/SCS reflects changes in planning assumptions, project lists, legislative requirements, local land use policies, and resource constraints.

The RTP/SCS plans how the San Joaquin County region will meet its transportation needs for the 25-year period from 2021 to 2046, considering existing and projected future land use patterns as well as forecast population and job growth. The RTP/SCS plans for and programs the approximately $12.6 billion in revenues expected to be available to the region from all transportation funding sources over the course of the planning period. It identifies and prioritizes expenditures of this anticipated funding for transportation projects of all transportation modes: highways, streets and roads, transit, rail, bicycle and pedestrian, as well as transportation demand management measures and intelligent transportation systems.

The RTP/SCS is based on a preferred regional land use and transportation scenario which lays out a pattern of future growth and transportation system investment. The preferred scenario combines a transit-oriented development and an urban infill approach for new growth area development. Accordingly, more population and employment growth is allocated within existing urban areas near public transit along centers and corridors. This reduces impacts on rural areas which contain the majority of agricultural land throughout the county. The transportation network includes additional highway, local street, active transportation, and transit investments to serve a more concentrated urban growth pattern. The preferred scenario also shifts investment towards bicycle and pedestrian improvements that complement public transit and other non-vehicle alternatives.

SJCOG, in developing scenario strategies, identified emerging trends that SJCOG as a regional planning agency could influence. The trends are transportation technology (particularly driverless vehicles), impacts from extreme weather events due to changes in climate, and the increase in teleworking and internet shopping (the e-economy). Three futures with assumptions about land use and transportation in the year 2050 were then prepared with each future dominated by one of the three emerging trends. These futures were used to prepare the alternative scenarios or packages of assumptions for testing.

The Plan identifies transportation system needs consistent with the preferred scenario and includes comprehensive lists of programmed and planned transportation investments that are intended to meet performance goals for mobility, safety, congestion relief, system preservation and environmental protection. In addition to its other components, the preferred scenario also includes an enhanced transit strategy that creates a framework for future transit service expansion at such time as new revenue sources become available. Recognizing the uncertain nature of future new revenue sources, it takes a targeted, balanced and flexible approach to expanding transit service as needed in the future. The Hybrid Preferred strategy commits to transit service expansion as new revenue sources become available, (1) identifying when transit enhancements are actually needed through quantitative triggers, and (2) protecting existing funding for competing local demands, such as street and road maintenance. The enhanced transit strategy is a strategy for the future. It does not change the list of fiscally constrained, programmed and planned transportation projects.

The plan is organized into nine chapters plus an Executive Summary:

0. Executive Summary
1. Introduction

2. Public Engagement
3. Policies and Strategies
4. Financing the Transportation System
5. Performance of the SCS
6. Economic Vitality
7. Innovation Technology
8. Housing
9. Framework for Moving Forward

Of these nine chapters of the 2022 RTP/SCS, Policies and Strategies (Ch. 3), Performance of the SCS (Ch. 5), and the Framework for Moving Forward (Ch. 9) are the three that include provisions with the potential to create physical changes to the environment and are the primary focus for analysis in this EIR. These elements are described in more detail below and hard copies of the 2022 RTP/SCS can be found at the offices of SJCOG or an electronic copy at this link: https://www.sjcog.org/608/Access-the-Draft-2022-RTPSCS-Plan .

2.4.1 Policy Element

The policy element identifies policies and strategies that meet regional needs. Policies are direction statements that guide present and future decisions on specific actions. For each policy there is a set of strategies, which are general action statements. Many of these policies and strategies address regional mobility, but there are others that address other regional issues such as lack of affordable housing, loss of farmland, and impacts from changes in climate and extreme weather events. The policies of the 2018 RTP/SCS have carried over to the 2022 plan in their existing form due to their continuing relevance to the region. However, a new criterion was used to develop additional new proposed strategies for the 2022 RTP/SCS. SJCOG developed strategies that perform well in identified probable futures in terms of greenhouse gas emissions, vehicle miles traveled, transit ridership and housing cost. After the completion of the list of proposed strategies, SJCOG assigned strategies to “scenarios” or sets of future assumptions to explore the effect of strategies on regional goals in the future. The broad policies that were carried over from the 2018 RTP/SCS into 2022 are listed below.

- Enhance the Environment for Existing and Future Generations and Conserve Energy;
- Maximize Mobility and Accessibility;
- Increase Safety and Security;
- Preserve the Efficiency of the Existing Transportation System;
- Support Economic Vitality;
- Promote Interagency Coordination and Public Participation for Transportation Decision-Making and Planning Efforts;
- Maximize Cost-Effectiveness; and
- Improve the Quality of Life for Residents.

The 2022 RTP/SCS does not provide project designs or a construction schedule. Adoption of the 2022 RTP/SCS would not represent an approval action for any of the individual transportation programs and projects listed in the financially constrained plan. Detailed site-specific alignment, location, design, and scheduling of the improvement projects which are included in the 2022

RTP/SCS are not fixed by the 2022 RTP/SCS, and these individual projects may be modified substantially from their initial description in the 2022 RTP/SCS at the time they are considered for implementation.

2.4.2 Sustainable Communities Strategy

This element provides future land-use assumptions upon which the SCS is constructed. SJCOG staff has met with each jurisdiction in San Joaquin County to discuss changes to current planning assumptions, or potential changes to the location of future development since the last RTP/SCS was developed. As with 2018, the scenarios presented for consideration varied in the location and intensity of future growth. These assumptions are guided in each scenario by general plans; however, general plans provide for a range of specific development characteristics based on future priorities and desires of residents, shifting demographics, incentives, and private sector responses to these variables. The land-use assumptions are matched to investment priorities and project lists for the public, stakeholders, and SJCOG committees and Board, prior to final approval of the RTP/SCS by the Board.

The SCS consists of the preferred land use and transportation scenario selected by SJCOG as most capable of meeting RTP goals. The 2022 RTP/SCS simultaneously addresses the region's transportation needs and encourages infill development near transit investments designed to reduce vehicle miles traveled (VMT) and overall GHG emissions. This strategy selectively invests in transportation systems that complement compact growth within transit corridors in existing urban areas.

The transportation projects, programs, and strategies contained in the RTP are major components of the SCS. However, the SCS also focuses on the region's general land use growth pattern, because the geographic relationships between land uses—including density and intensity— help determine travel demand. Thus, to meet requirements of SB 375, the SCS:

- Identifies existing and future land use patterns;
- Establishes a future land use pattern to meet GHG emission reduction targets;
- Identifies transportation needs and the planned transportation network;
- Considers statutory housing goals and objectives;
- Identifies areas to accommodate long-term housing needs;
- Identifies areas to accommodate eight-year housing needs; and
- Considers resource areas and farmland

These requirements, as outlined in California Government Code Section 65080(b)(2)(B), do not mean that the SCS creates a mandate for certain land use policies at the local level. In fact, SB 375 specifically states that the SCS cannot dictate local General Plan policies (see Government Code Section 65080(b)(2)(J)). Rather, the SCS is intended to provide a regional policy foundation that local governments may build upon as they choose and generally includes quantitative growth projections.

2.4.3 Action Element

The action element includes a list of transportation projects within projected estimated revenues and is consistent with the goals and policies established by the 2022 RTP/SCS. SJCOG updated and refined a baseline transportation project list through meetings with each jurisdiction in San Joaquin County, as well as the Regional Transit District, Caltrans, and the Regional Rail Commission. This

updating included removal of completed or substantially completed projects, the addition of any new future projects, or modifications to projects based on changes to scope or schedule.

While the RTP would detail total revenue assumed and planned investments, projects and actions by the SJCOG Board and local project sponsors would be assigned specific funding to individual projects. The RTP serves as a high-level blueprint for transportation investments and is subject to amendment, as required, to support delivery of future transportation projects.

2022 RTP/SCS Projects

The general locations of all physical projects of the 2022 RTP/SCS are identified in Figure 2-2 through Figure 2-9, and listed in Table 2-1.

The three largest sources of State funding for the SJCOG region include the Transportation Development Act, State Transportation Improvement Program, and State Highway Operations and Protection Program. The Transportation Development Act was signed into law in 1971. It provides two major sources of funding for public transportation: the Local Transportation Fund and the State Transit Assistance fund. Funds for the Local Transportation Fund come from ¼ percent of the general State sales tax. The 1997 passage of Senate Bill 45 created the State Transportation Improvement Program (STIP). The STIP is a five-year capital improvement program of transportation projects on and off the State Highway System. Every two years, the CTC adopts a fund estimate which identifies the amount of new funds available for the programming of transportation projects. The State Highway Operations and Protection Program (SHOPP) helps fund collision reduction, bridge preservation, roadway preservation, roadside preservation, and mobility enhancement projects, and preservation of other transportation facilities related to the State Highway System SHOPP funds also help repair damage caused by natural disasters, civil unrest, or terrorist acts.

The largest source of regional and local funding for the SJCOG region is Measure K, which is estimated to deliver an additional $2.552 billion worth of transportation improvements to the region. Major improvements target San Joaquin County freeways, streets and roads, public transit networks, pedestrian, and bicycle friendly programs. Measure K is a one-half cent sales tax for transportation in San Joaquin County. Measure K is administered by SJCOG, the Local Transportation Authority for San Joaquin County, and will provide local sales tax revenues for transportation projects in San Joaquin County over 30 years (2006 through 2036).

SJCOG has also been successful with competitive grant programs and makes some assumptions regarding continued success. These grant programs include SB 1 programs, the Active Transportation Program, and several cap-and-trade funding programs.

Figure 2-2 2022 RTP/SCS Projects – Countywide

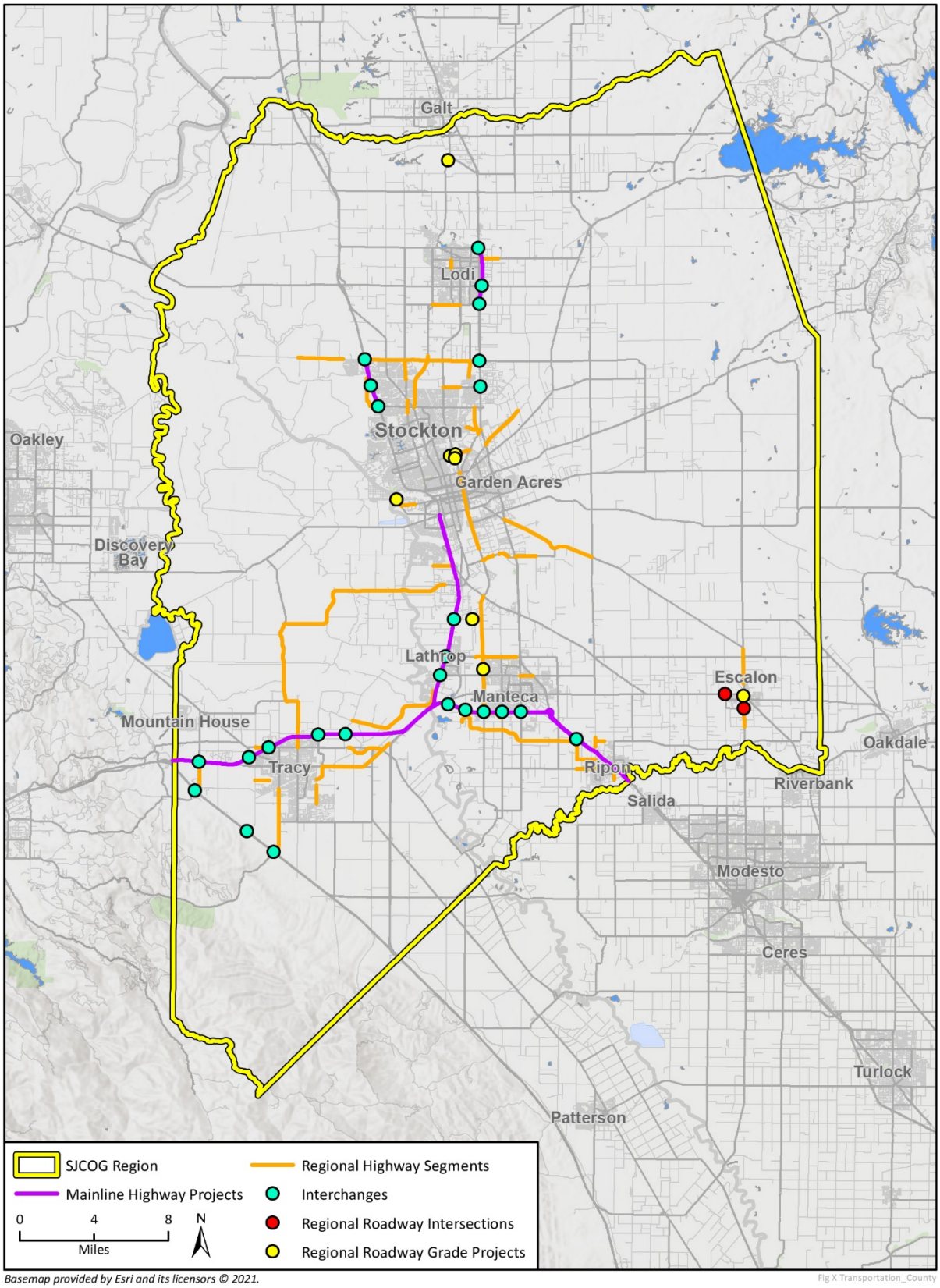


Figure 2-3 2022 RTP/SCS Projects – Escalon

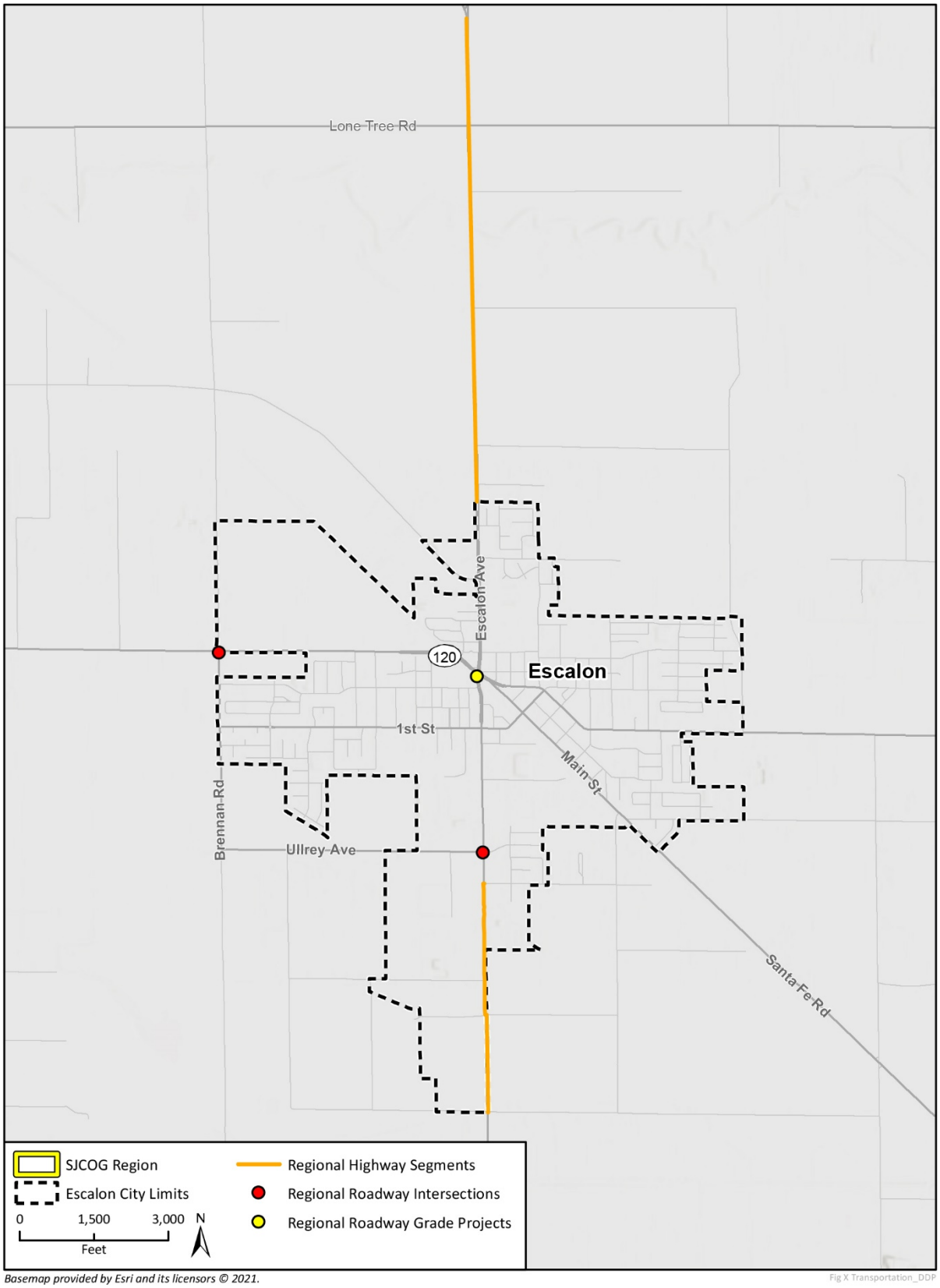


Figure 2-4 2022 RTP/SCS Projects – Lathrop

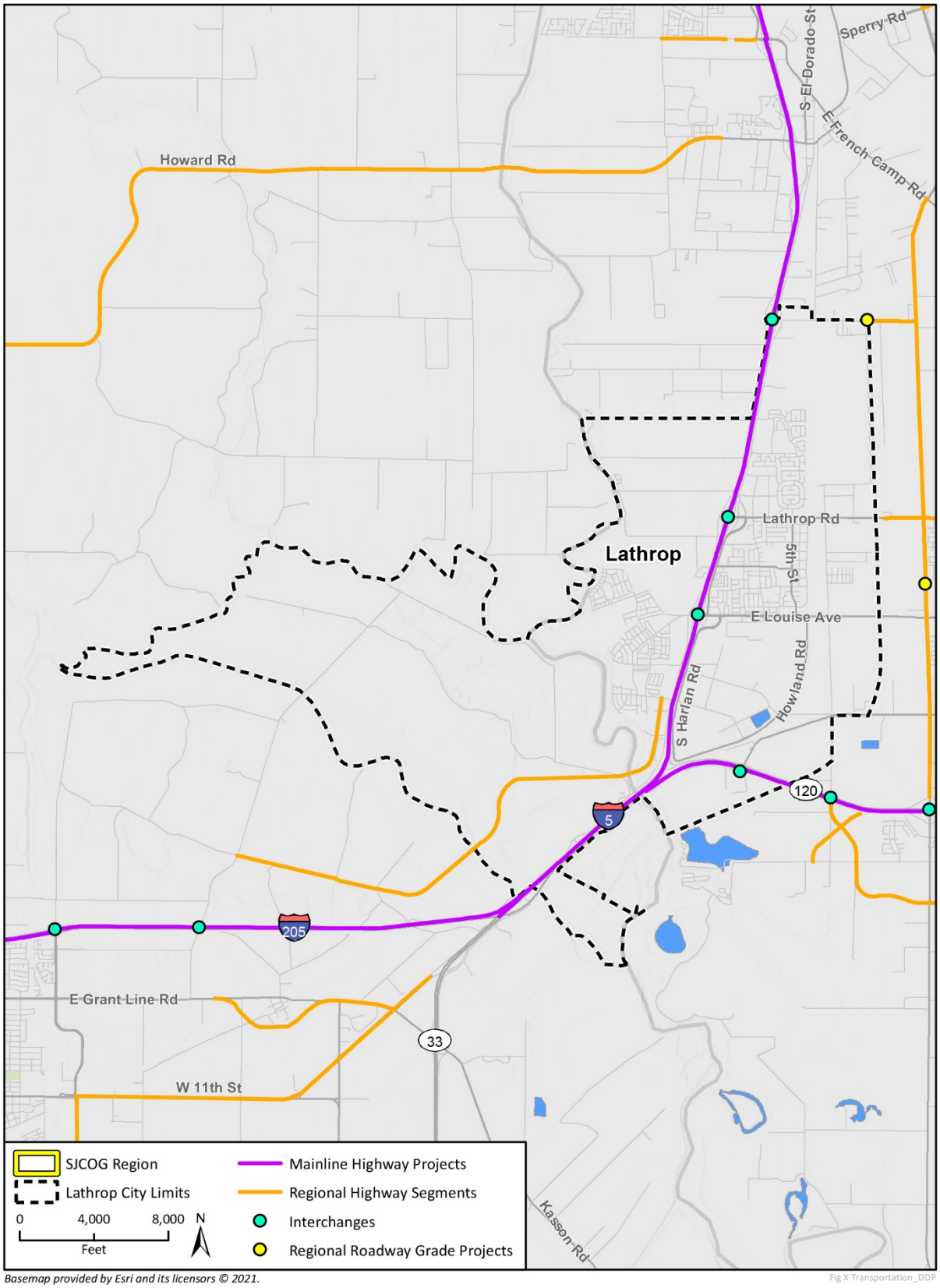


Figure 2-5 2022 RTP/SCS Projects – Lodi

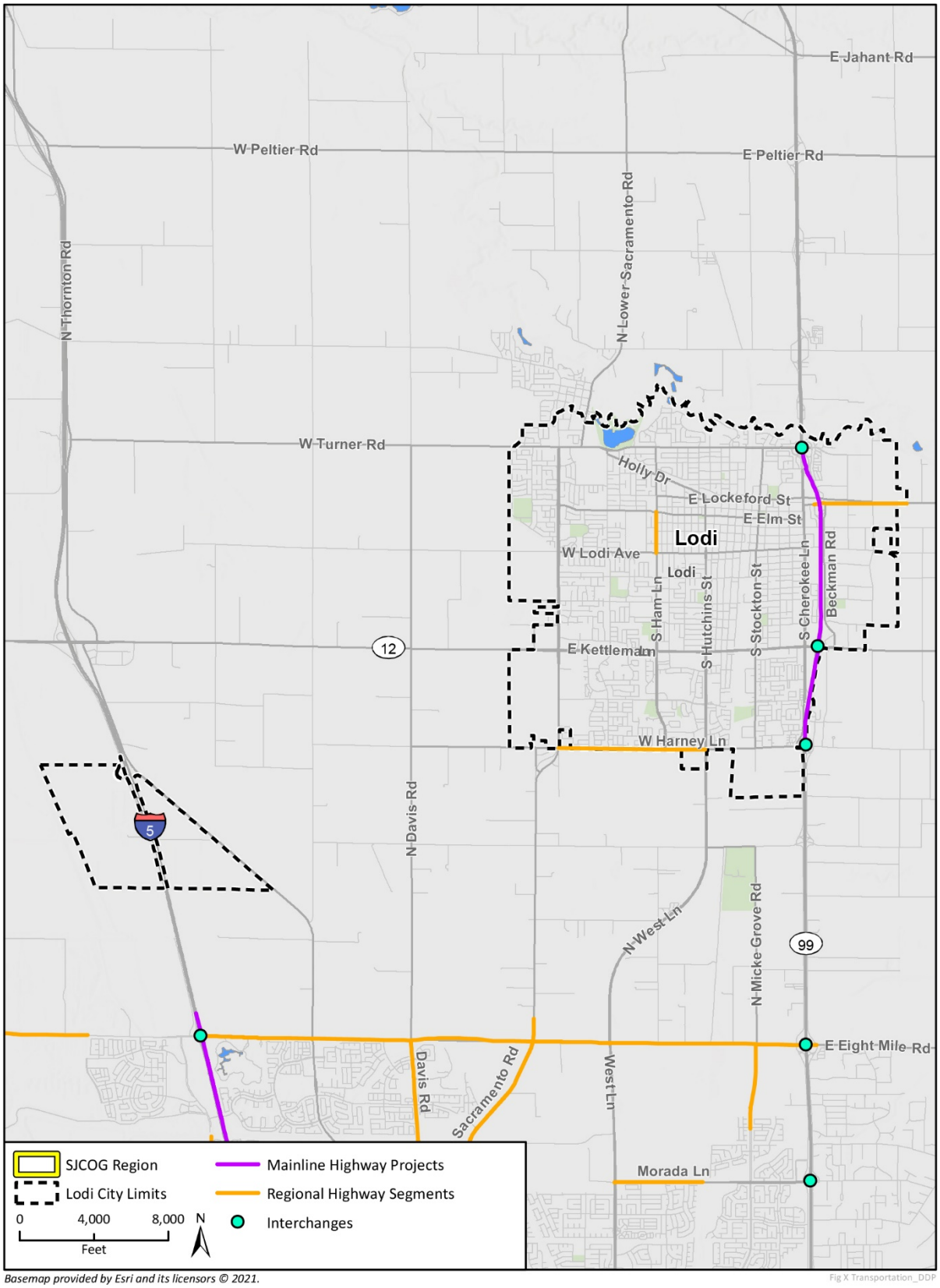


Figure 2-6 2022 RTP/SCS Projects – Manteca

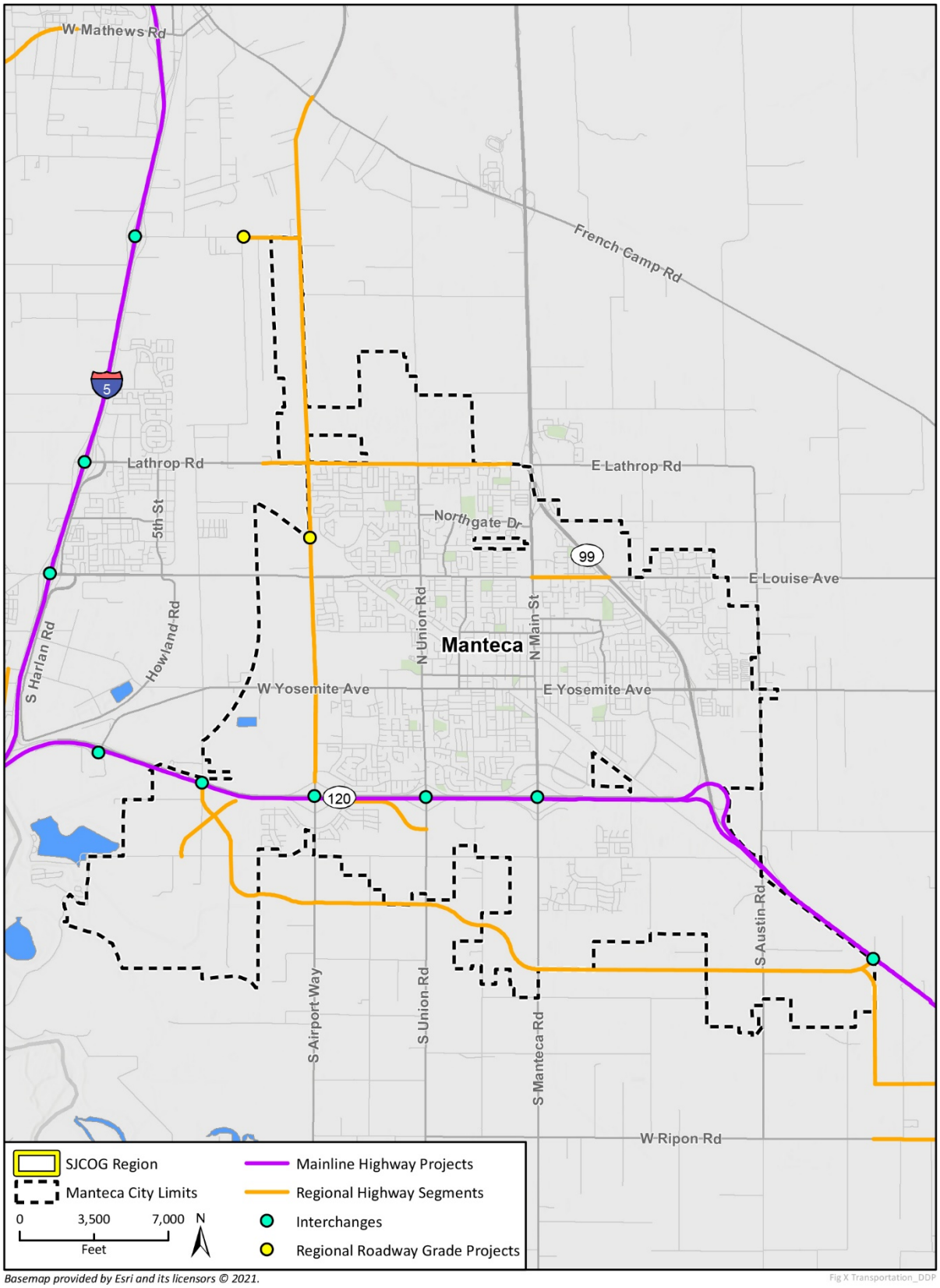


Figure 2-7 2022 RTP/SCS Projects – Ripon

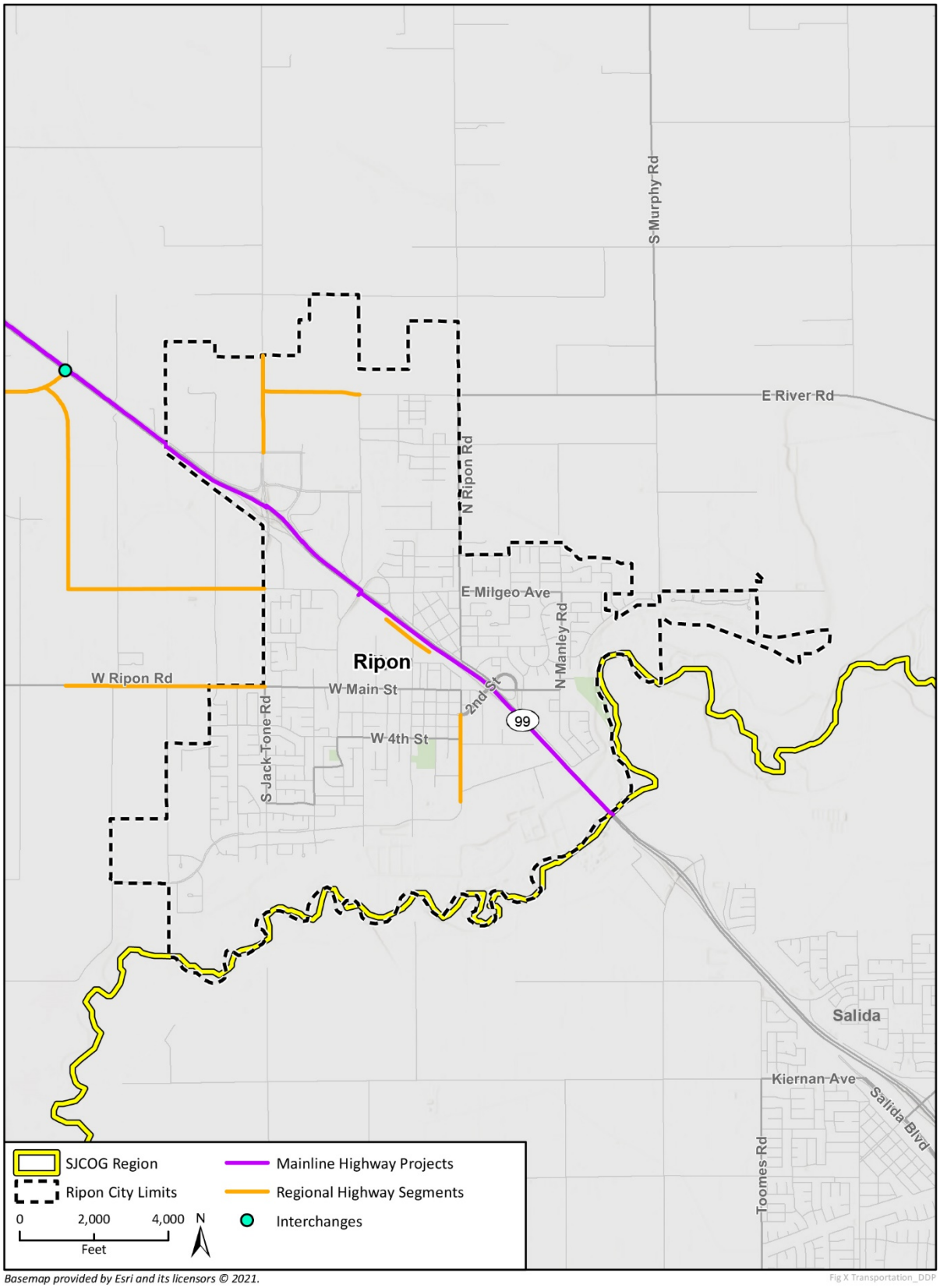
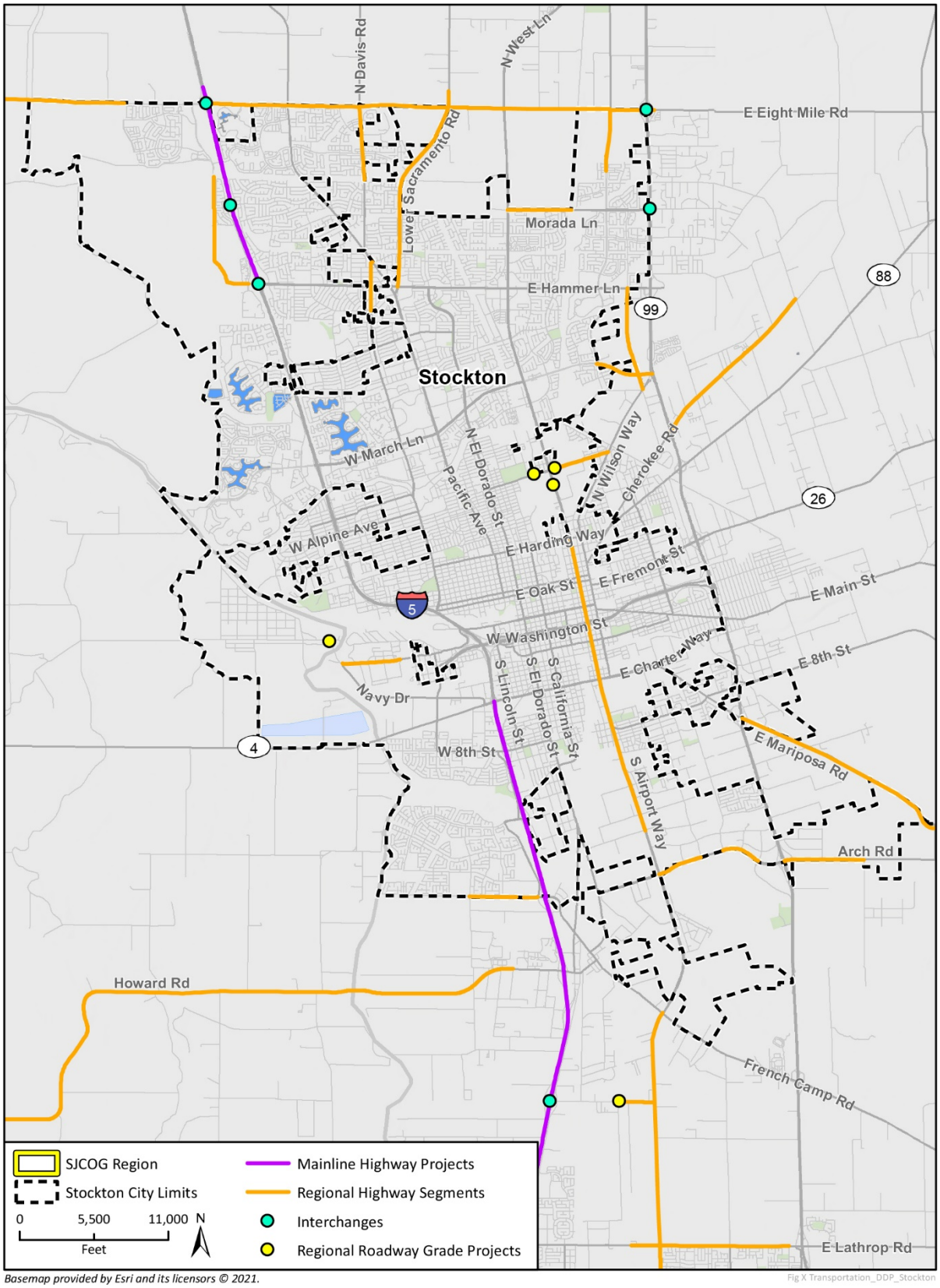


Figure 2-8 2022 RTP/SCS Projects – Stockton



Basemap provided by Esri and its licensors © 2021.

Fig X Transportation_DDP_Stockton

Figure 2-9 2022 RTP/SCS Projects – Tracy

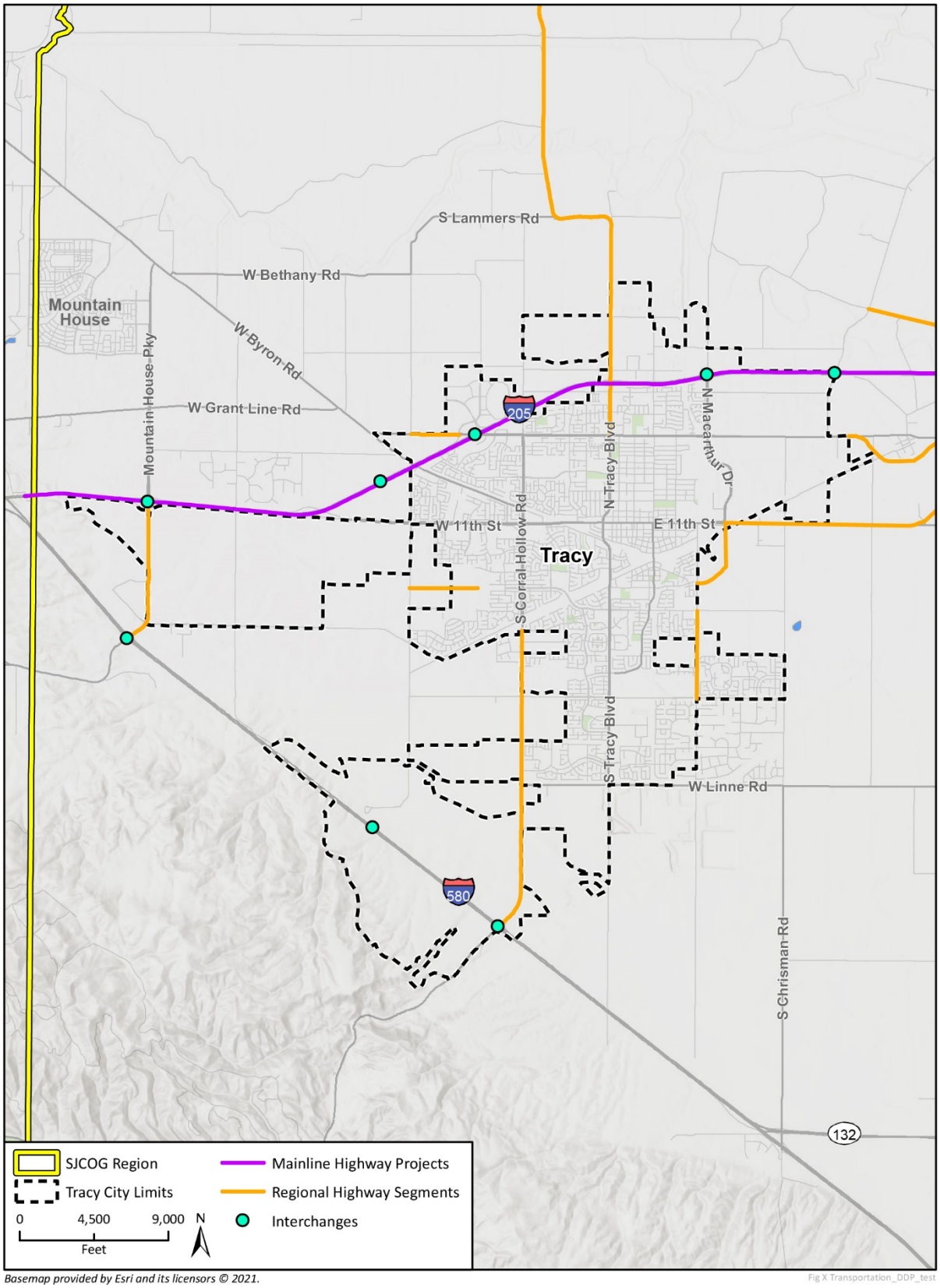


Table 2-1 The 2022 RTP/SCS Planned and Programmed Projects

Project Title	Project Type	Description
CALTRANS		
CT-1: SR 99/120 Connector Project Phase 1A	HWY	(Widen the eastbound SR 120 to southbound SR 99 connector ramp from one-lane to two-lanes; Remove the Austin Road overcrossing and replace with a new 4 lane structure spanning SR 99 and UPRR; Add a new connecting road from Austin Road to Woodward Ave and Moffat Blvd and modify the existing UPRR gated crossing at Woodward Ave;Temporarily close the Austin Road northbound entrance and southbound exit ramps, resulting in a partial interchange.)
CT-2: I-205 Managed Lanes	HWY	Widen from 6 to 8 lanes (inside/outside)
CT-3: I-205 Managed Lanes	HWY	Widen from 6 to 8 lanes (inside/outside)
CT-4: I-205 Managed Lanes	HWY	Widen from 6 to 8 lanes (inside/outside)
CT-5: I-5 HOV Mossdale	HWY	Widen to add HOV lanes with HOV Connector Ramps to I-205 and SR-120
CT-6: SR-120	HWY	Widen 4 to 6 lanes (inside)
CT-7: SR-99 HOV	HWY	Widen 6 to 8 lanes (inside/outside), including reconstruction of SR-99/Main Street and SR-99/Wilma Avenue interchanges and pedestrian overcrossing
CT-8: SR-99/120 Connector Project Phase 1B	HWY	Widen the northbound SR 99 to westbound SR 120 connector ramp from one-lane to two-lanes; Add an auxiliary lane in the existing median of westbound SR 120 from Main Street to SR 99; Convert the existing 99/120 separation structure to two lanes and construct a new separation structure to serve the eastbound 120 to northbound 99 connector ramp.)
CT-9: I-5 HOV	HWY	Widen from 6 to 8 lanes (inside median) including auxiliary lanes
CT-10: I-5 HOV	HWY	Widen 6 to 8 lanes (inside)
CT-11: I-5 HOV	HWY	Widen 6 to 8 lanes (inside)
CT-12: SR 99/120 Connector Project Phase 1C	HWY	Add braided off ramps from SR 99 and SR 120 to Austin Road; Add loop on ramp from Austin Road to northbound SR 99 and to westbound SR 120; Add auxiliary lane on eastbound SR 120 from Main Street to SR 99; Add an auxiliary lane in each direction on SR 99 from SR 120 to approximately 1.7 mile south of Austin Road and relocate the frontage road.
CT-13: SR 99 Widening	HWY	Widen 4 to 6 lanes (inside) - ENVIRONMENTAL ONLY
CT-14: Caltrans Intercity Rail	Rail	Construct double main track, panelized turnouts, relocate/renew siding turnout, and realign existing trackage.
CT-15: Stockton Diamond Grade Separation	Rail	In Stockton, construct track connections and grade separate the BNSF Stockton Subdivision and UPRR Fresno Subdivision diamond crossing
City of Escalon		
E-1: Ullrey Avenue /McHenry Avenue Intersection	ST/RDS	Reconstruct intersection, including addition of turn pockets, improvement of traffic signal and installation of train pre-emption system for UPRR railroad crossing.
E-2: SR 120/Brennan Avenue Intersection	ST/RDS	Intersection improvements
E-3: Escalon BNSF grade separation	ST/RDS	Construct a grade separation in Escalon at the BNSF Railroad

Project Title	Project Type	Description
E-4: eTrans Transit Operations	Transit	Costs associated with eTrans demand responsive and fixed route transit system
E-5: eTrans Capital Improvements	Transit	Bus replacements, passenger amenities, and miscellaneous equipment
E-6: Main Street	ST/RDS	Bike and Pedestrian Improvements
City of Lathrop		
La-1: I-5 at Louise Avenue	HWY	Reconstruct interchange
La-2: I-5 at Lathrop Road	HWY	Reconstruct interchange
La-3: SR 120 at Yosemite Avenue/Guthmiller Road	HWY	Reconstruct interchange
La-4: Golden Valley Parkway	ST/RDS	Construct new roadway parallel to I-5, 2 lanes from Brookhurst Boulevard to Stewart Road
La-5: Golden Valley Parkway	ST/RDS	Construct new roadway parallel to I-5, 4 lanes from Stewart Road to Paradise Road
La-6: Golden Valley Parkway	ST/RDS	Widen from 2 to 4 lanes, from Brookhurst Boulevard to Stewart Road
City of Lodi		
Lo-1: SR-99 at SR-12 West (Kettleman Lane)	HWY	Reconstruct interchange and widen to free flowing interchange
Lo-2: SR-99 at Harney Lane	HWY	Reconstruct interchange to provide 6 through lanes on SR 00, 4 lanes on Harney between Reynolds Ranch Parkway and SR 99 and modify on-ramps and off-ramps
Lo-3: SR-99 at Turner Road	HWY	Reconstruct interchange to provide operational and safety improvements on SR 00 at Turner Road
Lo-4: Harney Lane	ST/RDS	Widen from 2/3 lane collector to 4 lane divided arterial
Lo-5: Victor Road (SR-12)	ST/RDS	Widen from 2 to 4 lanes. Add center dual left turn lane, turn pockets at intersections and median separation with landscape
Lo-6: Ham Lane	ST/RDS	Widen 2/3 lanes to 4 lanes
Lo-7: Grapeline Capital	Transit	Bus stop shelters/improvements
Lo-8: Grapeline Capital	Transit	Transit facility upgrades
Lo-9: Grapeline Capital	Transit	Transit station expansion
Lo-10: Grapeline Operating	Transit	Costs associated with Grapeline fixed route and Paratransit/Dial-A-Ride services
Lo-11: Transit facilities safety and security system	Transit	Safety and security for Lodi Grapeline service
Lo-12: Southwest Transit Transfer Station	Transit	Construct transit transfer station in southwest Lodi
Lo-13: Bus replacements	Transit	Purchase replacement buses
Lo-14: Grapeline Capital	Transit	Bicycle support program
Lo-15: Grapeline Capital	Transit	Radio/communication upgrade
Lo-16: Grapeline Capital	Transit	Intelligent Transportation System (ITS) upgrades
Lo-17: Grapeline Capital	Transit	CNG Fuel upgrades
Lo-18: Grapeline Capital	Transit	Bus wash upgrades

Project Title	Project Type	Description
City of Manteca		
M-1: SR-120 at McKinley Avenue	HWY	Construct new interchange
M-2: SR-120 at Airport Way	HWY	Reconstruct interchange
M-3: SR-120 at Main Street	HWY	Reconstruct interchange
M-4: SR-99 at Raymus Expressway	HWY	Construction of new interchange – environmental only
M-5: Atherton Drive	ST/RDS	Construct new 4 lane roadway (gap closure)
M-6: Airport Way	ST/RDS	Widen from 2 to 4 lanes from SR-120 to Yosemite Avenue
M-7: Airport Way	ST/RDS	Widen from 2 to 4 lanes from Lathrop Road to Roth Road
M-8: Louise Avenue	ST/RDS	Widen from 2 to 4 lanes
M-9: Atherton Drive	ST/RDS	Construct new 4 lane roadway from McKinley Avenue to West of Airport Way
M-10: Lathrop Road	ST/RDS	Widen from 2 to 4 lanes
M-11: Raymus Expressway	ST/RDS	Construct new 4 lane expressway from Main Street to SR-99
M-12: Airport Way	ST/RDS	Widen from 2 to 4 lanes from Yosemite Avenue to Lathrop Road
M-13: Raymus Expressway	ST/RDS	Construct new 2 lane expressway from ST-120 to Woodward Avenue
M-14: Atherton Drive	ST/RDS	Construct new 4 lane roadway from Woodward Avenue to McKinley Avenue
M-15: Raymus Expressway	ST/RDS	Construct new 2 lane expressway from Woodward Avenue to Main Street
M-16: Airport Way	ST/RDS	Widen from 4 to 6 lanes from SR 120 to Lathrop Road
M-17: Airport Way/UPRR	ST/RDS	Construct 5 lane grade separation over the UPRR
M-18: Passenger Amenities	Transit	Bus shelters/pedestrian facilities, bike facilities, lighting and multifunctional landscaped area
M-19: Safety and Security	Transit	Costs associated with safety/security/ITS
M-20: Manteca Transit Rolling Stock	Transit	Purchase of replacement and new buses
M-21: Manteca Transit System Operations	Transit	Costs associated with the operations and administration of Dial-A-Ride and fixed route service in Manteca
M-22: Bus Maintenance and Storage Facility	Transit	Construct a bus maintenance and storage facility
M-23: Manteca Transit Planning	Transit	Costs to support transit planning efforts to update the City of Manteca Short-Range Transit Plan every fourt years
M-24: Bus Enhancements	Transit	Enhancements for Manteca Transit buses
M-25: Travel Training	Transit	Training to assist customers in using transit services
M-26: Transit Center Improvements	Transit	Construct improvements at Manteca Transit Center
City of Ripon		
R-1: Jack Tone Road, Phase 1	ST/RDS	Widen from 2 to 6 lanes from Santos Road to South Clinton Avenue
R-2: Garrison Road Gap Closure	ST/RDS	Construct 2 lane extension of Garrison Road
R-3: W. Ripon Road	ST/RDS	Widen from 2 to 6 lanes from Jack Tone Road to Olive Expressway

Project Title	Project Type	Description
R-4: Canal Boulevard Extension	ST/RDS	Construct 4 lane extension of Canal Boulevard from Jack Tone Road to Olive Expressway
R-5: Olive Expressway	ST/RDS	Construct 6 lane Olive Expressway, Environmental only
R-6: Ripon Blossom Express Operations	Transit	Costs associated with the delivery of a fixed route transit system
R-7: Ripon Dial-A-Ride Operations	Transit	Costs associated with the delivery of a Dial-A-Ride service in Ripon
R-8: Ripon Bus Purchases	Transit	Purchase of replacement and expansion buses
R-9: Transit Capital Improvements	Transit	Construct benches, shelters, and transit maintenance facility
R-10: Ripon Multimodal Station	Transit	Construct Multimodal Station
City of Stockton		
S-1: I-5 at Hammer Lane	HWY	Interchange modification and auxiliary lanes
S-2: I-5 at Otto Drive	HWY	Construction of a new interchange and auxiliary lanes
S-3: I-5 at Eight Mile Road	HWY	Modification of interchange
S-4: SR-99 at Eight Mile Road	HWY	Reconstruct interchange
S-5: SR-99 at Morada	HWY	Reconstruct interchange
S-6: Morada Lane	ST/RDS	Widen from 3 to 6 lanes from West Lane to UPRR
S-7: Alpine Avenue	ST/RDS	Widen from 2 to 4 lanes with a middle turn lane. Construct curb, gutter, sidewalks and driveways from UPRR (SPRR) to Wilson Way
S-8: Arch Road	ST/RDS	Widen from 2 to 6 lanes from Fite Court to Frontier Way
S-9: Arch Road	ST/RDS	Widen from 2 to 6 lanes from Frontier Way to SR-99
S-10: Maranatha Drive	ST/RDS	Construction of new 4 lane road from March Lane to Hammer Lane
S-11: Maranatha Drive	ST/RDS	Construction of new 4 lane road from Wilson Way to March Lane
S-12: Lower Sacramento Road	ST/RDS	Widen from 4 to 6 lanes from Armor Drive to Morada Lane
S-13: Lower Sacramento Road	ST/RDS	Widen from 2 to 6 lanes from Marlette Road to Pixley Slough
S-14: Lower Sacramento Road	ST/RDS	Widen from 4 to 6 lanes from Morada Lane to Hammer Lane
S-15: Airport Way	ST/RDS	Intersection and operational improvement from Harding Way to Industrial Road
S-16: Eight Mile Road	ST/RDS	Widen from 2 to 4 lanes from New Road D to New Road F
S-17: Eight Mile Road	ST/RDS	Widen from 2 to 4 lanes from New Road F to New Road E
S-18: Eight Mile Road	ST/RDS	Widen from 5 to 6 lanes from I-5 to Thornton Road
S-19: Eight Mile Road	ST/RDS	Widen from 2 to 4 lanes from Thornton Road to Lower Sacramento Road
S-20: Eight Mile Road	ST/RDS	Widen from 2 to 6 lanes from Lower Sacrament Road to West Lane
S-21: Eight Mile Road	ST/RDS	Widen from 2 to 6 lanes from West Lane to Holman Road
S-22: Eight Mile Road	ST/RDS	Widen from 2 to 6 lanes from Holman Road to SR 99
S-23: Arch Road	ST/RDS	Widen from 2 to 6 lanes from Newcastle Road to Fite Court
S-24: French Camp Road	ST/RDS	Widen from 2 to 6 lanes from Wolfe Road to Manthey Road
S-25: March Lane Extension	ST/RDS	Construction of new 8 lane road from Holman Road to SR 99

Project Title	Project Type	Description
S-26: Mariposa Road	ST/RDS	Widen from 2 to 4 lanes from Stagecoach Road to Austin Road
S-27: Alpine Road/UPRR (west)	ST/RDS	Construct at-grade quiet zone improvements
S-28: Alpine Road/UPRR (east)	ST/RDS	Construct a 4 lane grade separation
S-29: West Lane at UPRR	ST/RDS	Construct a 6 lane grade separation
City of Tracy		
T-1: I-205/Lammers Road/Eleventh Street	HWY	Construct interchange I-205 at Eleventh Street, realign and widen Eleventh Street to 6-lanes north of Grant Line to Byron Road. Construct auxiliary lane Hansen to Eleventh, in westbound I-205 Eleventh Street to Grant Line Road.
T-2: I-580 at International Parkway/Patterson Pass Road	HWY	Reconstruct interchange
T-3: I-205 at Mountain House/International Parkway	HWY	Reconstruct interchange
T-4: I-205 Grant Line Road	HWY	Modification of existing interchange
T-5: I-205 at Chrisman Road	HWY	Phase I; Construct new interchange east-west ramps
T-6 : I-205/MacArthur Interchange Modification	HWY	Modification of existing interchange – environmental only
T-7: I-580 at Corral Hollow Road	HWY	Modification of existing interchange – environmental only
T-8: I-580 at Lammers Road	HWY	Construction of new interchange – environmental only
T-9: I-580 at Iron Horse	HWY	Construction of new interchange – environmental only
T-9: International Parkway	ST/RDS	Widen from 2 to 4 lanes, including reconstruction of Delta-Mendota Canal and California Aqueduct bridges from I-205 to I-580
T-10: Corral Hollow Road	ST/RDS	Widen from 2 to 4 lanes from Parkside Drive to Linne Road
T-11: Schulte Road	ST/RDS	Extend 4 lane roadway from Faith Lane to Lammers Road
T-12: Grant Line Road	ST/RDS	Widen from 5 to 6 lanes from Naglee Road to Lammers Road
T-13: Grant Line Road	ST/RDS	Eiden from 3 to 4 lanes from Bydron Road to Lammers Road
T-13: Corral Hollow Road Widening	ST/RDS	Widen 2 to 4 lanes including ROW and construction of two bridges from Linne Road to I-580
T-14: MacArthur Drive	ST/RDS	Extend 4 lane roadway on new alignment and construct railroad grade separation from Mt. Diablo Road to Eleventh Street
T-15: Tracy Boulevard	ST/RDS	Widen from 4 lane minor arterial to 4 lane major arterial from I-205 to Eleventh Street
T-16: TRACER Capital	Transit	Purchase replacement buses
T-17: TRACER Operations	Transit	Costs associated with the delivery of fixed route and paratransit services including salaries, contracting of service, equipment, etc.
T-18: Tracy Transit Planning	Transit	Costs to support transit planning efforts to update the City of Tracy Short-Range Transit Analysis and Action Plan every five years
T-19: TRACER Grant Management and Administration	Transit	Costs to support transit service administration and Grant Management
T-20: TRACER Capital	Transit	Construction of bus stop improvements every five years

Project Title	Project Type	Description
RTD		
RTD-1: Bus Electrification / Power Distribution	Transit	Solar Energy System Phase I.
RTD-2: Bus Electrification / Power Distribution	Transit	Construction of hydrogen fueling infrastructure for use with Hydrogen Fuel Cell Electric buses and invest in Electrolyzer ($10M to build).
RTD-3: Bus Electrification / Power Distribution	Transit	Charging infrastructure will be needed if RTD replaces commuter bus with zero-emission electric bus. Depending on the bus purchase the following is an estimated infrastructure cost: Hydrogen: $750K to 1M for on-site tank dispenser (1-5 buses) ; Hydrogen: $1.5M to 2M for Full service station (5-30 buses); Electric: $1M to 1.5M for Depot charger/Induction Charger 5 FCEB pilot at $1.5 Million per Bus.
RTD-4: Bus Electrification / Power Distribution	Transit	Hydrogen and Lease of the Trailer (5 Years @ $350K per Year)
RTD-5: Bus Electrification / Power Distribution	Transit	Battery Energy Storage Systems at Regional Transportation Center (RTC), County Transportation Center (CTC), and possibly Downtown Transit Center (DTC) for peak saving energy initiatives.
RTD-5: Bus Electrification / Power Distribution	Transit	Replace 2 existing 500kW overhead charger (DTC).
RTD-6: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Replace (1) MCI D4500 (Commuter)
RTD-7: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Replace nine (14) GILLIG diesel-electric hybrid buses with zero-emission battery electric buses in SMA fleet. ($1.2 M per Bus)
RTD-8: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Replace eight (13) GILLIG diesel-electric hybrid buses with zero-emission electric buses in BRT fleet.
RTD-9: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Replace (2) Protera - EcoRide BE-35 (SMA)
RTD-10: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Replace (2) MCI 34500 (Commuter)
RTD-11: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Replace (6) Nova Hybrid LF Articulated (SMA)
RTD-12: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Replace (6) Seacraft/Ford Transit 350 HD (VanGo)
RTD-13: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Replace (22) Glaval Titan II LF (Hopper)
RTD-14: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Replace (14) Glaval/Ford Transit 350 HD (VanGo)
RTD-15: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Replace (6) ADA Cut-away gasoline (Replaces Item I9)
RTD-16: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Replace one (1) diesel bus over the-road coach with either a zero-emission electric bus or diesel bus in Commuter fleet.
RTD-17: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Replace 12 cutaway Buses used by United Cebral Palsy to transport individuals who would otherwise use SMA Paratransit.
RTD-18: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Bus component rebuild and parts.

Project Title	Project Type	Description
RTD-19: Bus Rolling Stock - Buy/Replacement/Rehab/Rebuild	Transit	Hybrid Electric Buses (5 new/additional buses)
RTD-20: Safety & Security	Transit	To upgrade surveillance/security camera system at RTD's facilities and bus stations/stops; to purchase assessment service, management tool, software and equipment to improve RTD's cyber security.
RTD-21: Safety & Security	Transit	Purchase and/or replace disinfecting chemical vehicle foggers and other misc. safety-related equipment.
RTD-22: Safety & Security	Transit	Radios for security Guards to connect with dispatch and customer service
RTD-23: Safety & Security	Transit	Pedestrian Collision and Avoidance Detection System and other safety/security related project with 5% annual increase
RTD-24: Communication System, Fare Collection (Mobile), Computer Software & Hardware, and Misc. Equipment	Transit	To purchase and install support equipment for bus and facilities, including Bus Video Standardization System, contactless fare collection across all fixed route buses and other support tools/equipment related to buses and facility, such as operator barriers, bus air purification systems and Trapeze replacement.
RTD-25: Communication System, Fare Collection (Mobile), Computer Software & Hardware, and Misc. Equipment	Transit	RTD will hire consultant to provide plans for a new ERP System. Scoping consulting to provide suggestions/planning on new ERP that will provide Integrated Financial and administrative solution (Financial, Budget, HR & Employee Online, Grants management, Procurement & Contracts Management, Inventory, & Retirement database)
RTD-26: Communication System, Fare Collection (Mobile), Computer Software & Hardware, and Misc. Equipment	Transit	To purchase and install support equipment for bus and facilities. This includes computers and software, ERP, procurement and HR management systems and other misc. equipment.
RTD-27: Communication System, Fare Collection (Mobile), Computer Software & Hardware, and Misc. Equipment	Transit	Computer, printer, scanner, camera, video, smartphone, office furniture, Transit Vehicle Public Display Monitor System, non-revenue vehicle GPS and other misc. items. 5% annual increase
RTD-28: Communication System, Fare Collection (Mobile), Computer Software & Hardware, and Misc. Equipment	Transit	Transit Vehicle Public Display Monitor System Project
RTD-29: Planning/Study/Training, Outreach and Research Projects	Transit	Zero-Emission Blueprint.
RTD-30: Planning/Study/Training, Outreach and Research Projects	Transit	TAM Upgrade.
RTD-31: Planning/Study/Training, Outreach and Research Projects	Transit	Hydrogen Fuel Cell Electric Bus training.
RTD-32: Planning/Study/Training, Outreach and Research Projects	Transit	Integrated Mobility Innovation Research Project.
RTD-33: Planning/Study/Training, Outreach and Research Projects	Transit	System Redesign Study / Service Equity Analysis. Perform an analysis of the service disruptions in the County Hoppers due to the shortage of drivers that was effective July 1, 2021.
RTD-34: Planning/Study/Training, Outreach and Research Projects	Transit	RTD's Title VI Procedure Upgrade and Service Equity Analysis

Project Title	Project Type	Description
RTD-35: Operating Costs	Transit	Costs associated with Bus Rapid Transit (BRT), Stockton Metropolitan Area (SMA), Intercity and County Hopper, Interregional Commuter, Dial-A-Ride, Van GO! Operations
RTD-36: Facilities Improvement and Upgrade	Transit	Bus Stations/Stops/Terminals: Costs associated with upgrade and improvement at RTD's bus stations and stops, including bus passenger information signage, bus shelter solar lights, HVAC replacement, roof/window replacement, trash cans and benches, and other miscellaneous upgrade and improvement.
RTD-37: Facilities Improvement and Upgrade	Transit	Install new BRT bus shelters and bus stop amenities (trash cans and benches) for the NEXTGEN route 49 recommendation.
RTD-38: Facilities Improvement and Upgrade	Transit	Costs associated with capital improvement and upgrade at RTD's Admin and Maintenance facilities. This includes the upgrades in electrical gear switch, fire alarm and LED lighting systems at RTC; storm drain emergency shutoff valve construction at RTC; maintenance shop retrofit and floor repair at RTC; HVAC units replacement at DTC and wrought fence construction at CTC, pavement re-seal at CTC, bird netting at Regional Transportation Center (RTC), RTC Floor repair and other refurbishment improvement. with 5% annual increase
RTD-39: Facilities Improvement and Upgrade	Transit	Projection for the next 5 year rehabilitation/renovation at RTD's Admin and Maintenance facilities (CTC, DTC, Hammer Transit Station [HTS] and RTC). This includes capital improvements/remodel to extend useful life of CTC and HTS buildings; installation of generator at DTC to power building during emergency; replacement of portable bus lifts and lube pumps at RTC; replacement of building exhaust fans and gas heaters and furniture.
RTD-40: Support Vehicles – Acquisition/Rehab/Renovation	Transit	To purchase, refurb and rehab support vehicles for RTD's Admin/Maintenance. Approximately 12- non-revenue vehicles to replace in the next 5 years , with an average cost of $75K per vehicle.
RTD-41: Future Operations	Transit	Future Operations
RTD-42: Future Capital	Transit	Future Capital
San Joaquin County		
SJC-1: Howard Road	ST/RDS	Passing lanes and channelization from Tracy Boulevard to Matthews Road
SJC-2: Grant Line Road Corridor Improvements	ST/RDS	Realign roadway and widen from 2 to 4 lanes with operational and safety improvements from Tracy City Limits to 11th Street
SJC-3: Tracy Boulevard	ST/RDS	Passing lanes and channelization from I-205 to Howard Road
SJC-4: Eleventh Street	ST/RDS	Operational and safety improvements along corridor and at intersections from Tracy City limits to I-5
SJC-5: Roth Road	ST/RDS	Widen from 2 to 4 lanes with shoulders from UPRR to Airport Way
SJC-6: Airport Way	ST/RDS	Widen from 2 to 4 lanes from Roth Road to French Camp Road
SJC-7: Escalon Bellota Road	ST/RDS	Widen from 2 to 4 lanes with shoulders from Escalon City limits to Mariposa Road
SJC-8: Mariposa Road	ST/RDS	Widen roadway from 2 to 3 lanes and widen BNSF railroad grade separation from 2 to 4 lanes from Austin Road to Jack Tone Road

Project Title	Project Type	Description
SJC-9: Lower Sacramento Road/UPRR (near Woodson Road)	ST/RDS	Replace grade separation of roadway and railway
SJRRC		
SJRRC-1: ACE Capital	Rail	Purchase rail cars for ACE service expansion
SJRRC-2: ACE Capital	Rail	SJRRC shared costs for the overall maintenance of vehicles
SJRRC-3: ACE Capital	Rail	Realignment of tracking
SJRRC-4: ACE Capital	Rail	Restoration of abandoned Western Pacific Depot building
SJRRC-5: Stockton Track Extension Phases II & III (ACE Gap Closure Project)	Rail	Allow SJRCC to operate on separate tracks from Union Pacific Railroad between maintenance yard and the station siding.
SJRRC-6: ACE Service Extensions	Rail	Enhance/extend rail to benefit residents; integrate ACE with the State intercity rail service; extend ACE service
SJRRC-7: ACE Forward	Transit	Acquisition of ACE Corridor between Stockton and Niles Junction
SJRRC-8: Phase II Implementation Plan for the Central Valley Rail Service	Rail	Commuter rail service
SJRRC-9: Operations	Transit	Shuttle Services in San Joaquin County stations
SJRRC-10: Capital	Rail	Maintenance Facility Expansion from 9 train sets to 17 train sets Phase 2
SJRRC-11: ACE Operations	Transit	ACE operations and Capital Access Fee (5 trains from 2012 to 2016, 6 trains from 2017 to 2021, 7 trains from 2022 to 2029 and 8 trains from 2030 to 2041)
SJRRC-12: Rail Information Systems	Transit	Rail Information Systems (Ticket vending machines, on-train internet, changeable message signs at stations, trip planner via internet, real time system for train status for ACE and other connecting services)
SJRRC-13: Central Valley Rail Service	Transit	Central Valley Rail Service Operations and Maintenance, Capital Access Fees, ROW purchase)
SJRRC-14: ACE Capital	Rail	Rolling Stock/Track Improvements/ Station Improvements
SJRRC-15: ACE Capital	Rail	Central Valley to Sacramento Commuter Rail Project - Extension of services
SJRRC-16: ACE Capital	Transit	Altamont Corridor Speed and Safety upgrades (including signal upgrade to automatic train stop increase train speed from 79 to 90 MPH and several track realignment projects)
SJRRC-17: Minor Capital	Rail Station	Facilities and information technology maintenance and enhancements, fleet vehicle replacements and expansion
SJRRC-18: ACEforward: Capital Phase 1	Rail	Extension of Wyche Siding
SJRRC-19: ACEforward: Capital Phase 1	Rail	Connection from UPRR Fresno Sub to UPRR Oakland Sub
SJRRC-20: ACEforward: Capital Phase 2	Rail	Grade crossing improvements/grade separations
SJRRC-21: Robert J. Cabral Station Expansion	Rail Station	Construct park and ride lot and related on-street parking, sidewalks, lighting, security, and other passenger amenity improvements

Project Title	Project Type	Description
SJRRC-22: Lathrop/Manteca Station Platform Extension project	Rail Station	Lengthen platform at current Lathrop/Manteca Station to allow for eight car train capacity
SJRRC-23: Tracy Station Platform Extension project	Rail Station	Lengthen platform at current Tracy Station to allow for eight car train capacity
SJRRC-24: Lathrop Transfer Station	Rail Station	Lathrop Transfer Station- Between ACE and Central Valley Service
SJRRC-25: Manteca Station Project - Platform	Rail Station	Manteca Station Project - Platform
SJRRC-26: Manteca Station Project - Parking	Rail Station	Manteca Station Project - Parking
SJRRC-27: Ripon Station Project - Platform	Rail Station	Ripon Station Project - Platform
SJRRC-28: Ripon Station Project - Parking	Rail Station	Ripon Station Project - Parking
SJRRC-29: 2nd Main Ripon to Modesto	Rail	2nd Main Ripon to Modesto
SJRRC-30: Rolling stock associated with SB 132	Trains	Rolling stock associated with SB 132
Tri-Valley/SJV		
Tri-Valley/SJV-1: Altamont Pass Corridor	Rail Study	Environmental document for transit connectivity
Tri-Valley/SJV-2: Altamont Pass Corridor	Rail Improvements	Improve the Union Pacific Railroad right-of-way from the San Joaquin County Line for a passenger rail service. Construction of a station and platform to accommodate the new passenger rail service with parking and access onto Patterson Pass Road. Construction of an operations and maintenance facility at Hanson Road in Tracy along the alignment.

Notes:
Bike/Ped - Bicycle or Pedestrian
HWY – Highway
ST/RDS = Street or Roadway
Transit = Public Transportation Infrastructure
Various = Project/funding of different types

2.5 Required Approvals

Approval of the 2022 RTP/SCS is at the discretion of SJCOG. It should be noted that additional environmental review will have to be conducted by the project sponsor as the lead agency for the individual projects contained in the 2022 RTP/SCS, prior to project implementation. Depending on the location of the project, future approvals for individual transportation projects identified in the 2022 RTP/SCS would have to be completed by one or more of the following agencies:

- San Joaquin Council of Governments
- California Department of Transportation (Caltrans)
- California Public Utilities Commission's Rail Crossings Engineering Section
- San Joaquin Regional Transit District (RTD)
- Cities of:

  - Escalon
  - Lathrop
  - Lodi
  - Manteca
  - Ripon
  - Stockton
  - Tracy
- County of San Joaquin

The relationship of this Program EIR to future environmental review of individual transportation projects is further discussed in Section 1.0, *Introduction.*

2.6 Relationship to Other Plans and Programs

The RTP provides a sound basis for the allocation of state and federal transportation funds for transportation projects within each California county over the subsequent 20-years. The RTP follows guidelines established by the State of California Transportation Commission to:

- Describe the transportation issues and needs facing the county;
- Identify goals and policies for how SJCOG will meet those needs;
- Identify the amount of money that will be available for identified projects; and
- Include a list of prioritized transportation projects to serve the county's long-term needs consistent with the funds allocated while considering environmental impacts and planning for future land use.

The 2022 RTP/SCS has been evaluated for consistency with the goals, policies and objectives currently being implemented by municipal and county planning agencies within the region. A consistency discussion of the 2022 RTP/SCS and other land use plans and agencies is provided in Section 4.9, *Land Use and Planning*. The 2022 RTP/SCS would be implemented with several other existing SJCOG programs designed to reduce adverse impacts to transportation resources, air quality, greenhouse gas (GHG) emissions, and energy.

The 2022 RTP/SCS Program EIR builds on the analysis and mitigation contained in the 2018 RTP/SCS Program EIR. The 2022 RTP/SCS project list is similar to the project list for the 2018 RTP/SCS, although some of the transportation projects from the 2018 RTP are now considered committed and are included in the No Project Alternative. The 2022 RTP/SCS evaluates the most recent projects and policies and provides more direct comparisons between current conditions and expected future Plan conditions. The 2022 RTP/SCS Program EIR includes additional analysis of cumulative, growth-inducing, and other indirect impacts.

The 2022 RTP/SCS has a maintenance and operations focus. As such, there are less environmental impacts as there are fewer capacity increasing projects than in previous plans; those that are included are generally focused in already developed areas and are anticipated to include features supporting alternative modes of transportation and/or ride sharing options as contextually appropriate.

This page intentionally left blank.

3 Environmental Setting and Impact Analysis Approach

This section provides a general overview of the environmental setting for the 2022 RTP/SCS, including a regional setting, sub-regional setting, and a description of the regional transportation system. This section also outlines the EIR baseline and approach to direct and cumulative impact analyses. More detailed descriptions of the environmental setting for each environmental issue area can be found in Section 4.0, *Environmental Impact Analysis*.

3.1 Regional Setting

Located at the center of California's vast agricultural operations, San Joaquin County is located in the San Joaquin Valley. The County encompasses over 900,000 acres (about 1,425 square miles) and is bordered by Sacramento County to the north, Stanislaus County to the south, Amador and Calaveras Counties to the east, and Contra Costa and Alameda Counties to the west. The county seat for San Joaquin County is the city of Stockton. San Joaquin County includes relatively level, agriculturally productive lands. Major landforms in the County include the foothills of the Diablo Range in the southwest, the foothills of the Sierra Nevada in the east, and the Delta in the northwest. State Route 99 (SR 99) and Interstate 5 (I-5), two of the State's major north-south freeways, pass through San Joaquin County. Interstate 205 (I-205) and Interstate 580 (I-580) provide direct connections to the San Francisco Bay Area to the west. Three transcontinental railroads (including Amtrak Service), the Stockton Metropolitan Airport, and the Port of Stockton connect the County to the State, nation, and world.

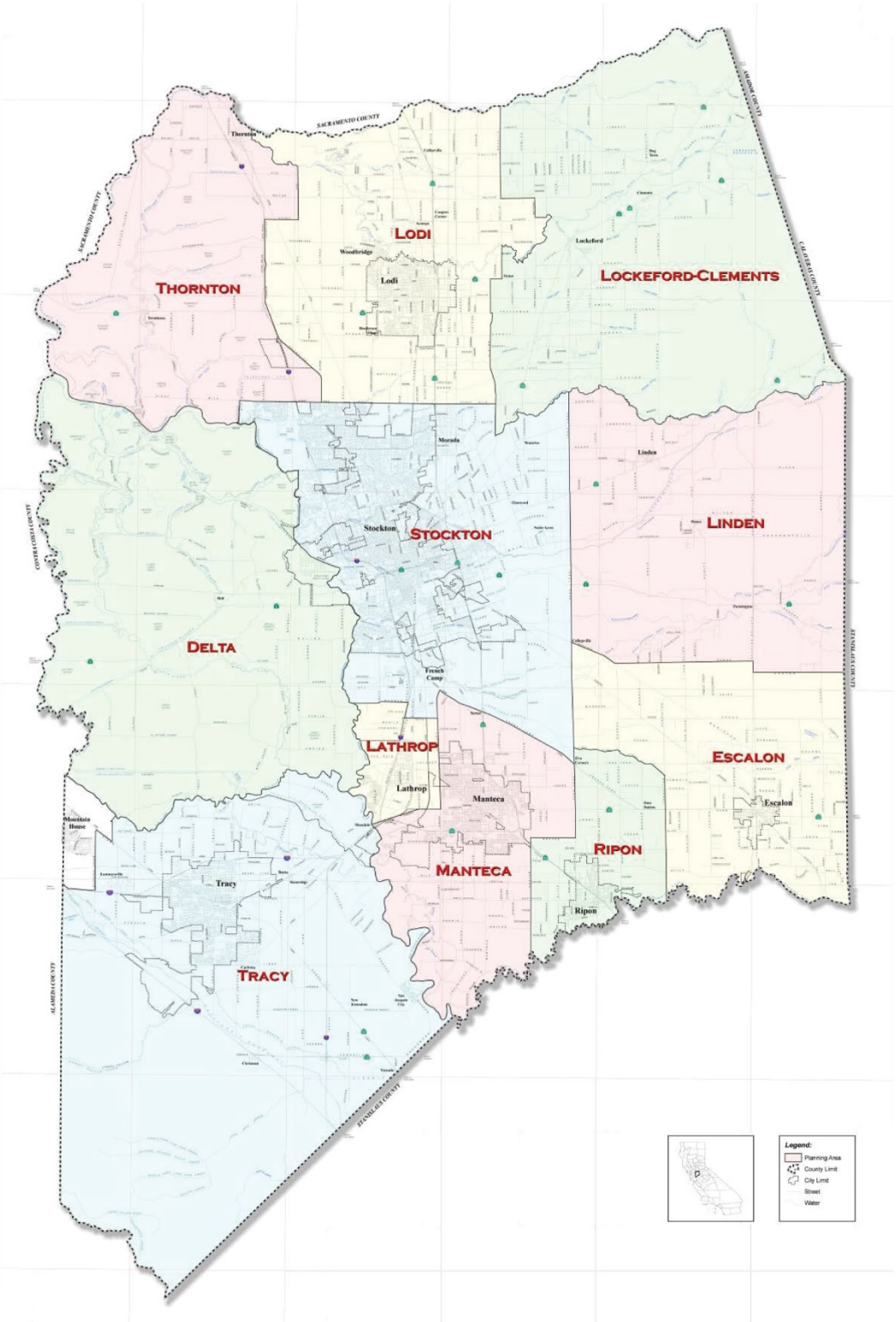
San Joaquin County's General Plan divides the County into 12 Planning Areas: the Delta, Escalon, Lathrop, Linden, Lockeford, Lodi, Manteca, Mountain House, Ripon, Stockton, Thornton, and Tracy (see Figure 3-1**)**. The General Plan Planning Areas include all lands within the County line and any additional areas in which adopted County policies may relate, not including lands in the seven incorporated cities (Escalon, Lathrop, Lodi, Manteca, Ripon, Stockton, and Tracy).

3.2 Regional Growth Setting

The County covers approximately 1,440 square miles and is predominantly flat land with some gently rolling hills. The County is bordered to the southwest by the Diablo Range and to the east by the Sierra Nevada foothills. The County contains a combination of metropolitan and rural areas with a long history of agricultural activities. San Joaquin County is considered one of the fastest growing regions in the Central Valley, with the population expected to reach over a million people by 2050.

While much of this trend continues to be the result of "spillover" from the Bay Area, the County's geographical advantages and quality of life also contribute to the growth. This growth has led to increased urbanization and the persistent challenge to meet state and federal air quality requirements.

Figure 3-1 San Joaquin County General Plan Planning Areas



Source: ***San Joaquin County, 2009***

Economically, San Joaquin County continues to grow in many segments of its economy. Downtown revitalization efforts in Stockton, Big League Dreams and Great Wolf Lodge in Manteca, and the Lodi area's success in producing world-class wines are shaping San Joaquin County into a destination for tourism and entertainment. The region also continues to be an attractive location for new warehousing and distribution centers that serve Northern California, the Bay Area, and the west coast. A centralized and diverse network of highway, rail, air, and seaport facilities support the continued development of San Joaquin County into a major goods movement region.

As San Joaquin County is transformed, these growth factors have profound effects on the ability to finance, deliver, and maintain the transportation infrastructure. The 2022 RTP/SCS aims to build on the 2018 RTP/SCS to create an efficient and effective multimodal transportation system for San Joaquin County that balances the needs for maintenance and preservation with expansion and enhancements. A conscious effort is made to design a system that both promotes mobility as well as preserves the environment. This effort is guided by a set of overarching goals.

Due primarily to the availability of housing at lower costs than surrounding communities to the north and to the west of San Joaquin County, the County is a place where many residents travel long distances for employment outside the County. Specifically, State Routes 4 and 12 link the east and west sides of the County. Each operates as a freeway segment for a brief but important segment between State Route 99 and I-5. Both routes also connect with Bay Area counties across the San Joaquin Delta and carry substantial commuter and interregional traffic.

3.3 Regional Transportation System

3.3.1 San Joaquin County

The San Joaquin County transportation system is designed to meet the multiple needs of residents and businesses. The County's central position within the state provides key routes and linkages for the movement of goods throughout California and to the rest of the United States. The County has one of the few deep-water ports within the State at the Port of Stockton, an airport that serves international markets, key highway corridors, and the hub for a number of major railroads. Given the County's location, San Joaquin County serves as a major transportation center for warehousing and distribution activities, as well as a source of more affordable housing for employees working in the Bay Area.

Several major vehicle routes traverse the County and provide important links for employees and goods to other parts of California, such as the Bay Area and Sacramento. These major routes include Interstates I-5, 205, and 580, as well as State Routes 99, 120, 12 and 4. The I-205/I-580 corridor serves as a major gateway between the Bay Area/Silicon Valley and the County.

The County has six airports open to the public that offer a variety of aviation services, to various domestic and international locations. Stockton Metropolitan Airport is owned and operated by San Joaquin County and offers general aviation services along with commercial passenger service to places such as Las Vegas, Phoenix, and San Diego. The second largest airport is the Tracy Municipal Airport, which is owned and operated by the City of Tracy.

There are a number of rail lines that traverse the County and provide transportation services for both passengers and freight. A partnership between the Union Pacific and the Burlington Northern and Santa Fe (BNSF) Corporation operates an intermodal shipping yard providing a key connection for truck-rail freight movement. Amtrak provides passenger service to the County, while the

Altamont Corridor Express (ACE) provides direct commuter rail service to Silicon Valley (with stops in Stockton, Lathrop, Manteca, and Tracy).

Regional public transit is provided by San Joaquin Regional Transit District (SJRTD) bus service. The SJRTD offers fixed-route buses, intercity buses, interregional buses, and dial-a-ride services. Transit operators provide local bus services in most of the local jurisdictions throughout the county. A variety of Class I-III bicycle routes in many areas provide additional transit alternatives.

3.4 EIR Baseline, Approach for Direct and Cumulative Analyses

3.4.1 Mitigation Approach

This EIR includes proposed mitigation measures to reduce impacts and identifies agencies for implementation of those mitigation measures. SJCOG has lead agency status; and therefore, authority to enforce mitigation measures for projects for which they have discretionary authority. However, SJCOG does not have authority to require recommended mitigation measures be implemented by other implementing agencies (e.g., Caltrans, cities, transit agencies, etc.) that are responsible agencies for this 2022 RTP/SCS EIR, but for applicable, project specific review, those implementing agencies will be Lead Agency under CEQA/NEPA for future transportation and land use development projects. It is the responsibility of the lead agency implementing specific 2022 RTP/SCS projects to conduct environmental review consistent with CEQA and where applicable, incorporate mitigation measures provided herein and developed specifically for the project to reduce impacts. Project-specific environmental documents may adjust the mitigation measures identified in this EIR as necessary to respond to site-specific conditions.

3.4.2 EIR Baseline

Under CEQA, the impacts of a proposed project must be evaluated by comparing expected environmental conditions after project implementation to conditions at a point in time referred to as the baseline. State CEQA Guidelines Section 15125 states that an EIR should describe physical environmental conditions of the project as they exist at the time the Notice of Preparation (NOP) is published, or if no NOP is published, then at the time environmental analysis is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant.

As the State CEQA Guidelines Section 15125 states, ordinarily the appropriate baseline will be the actual environmental conditions existing at the time of CEQA analysis, typically when the NOP is published. However, the CEQA Guidelines also contemplate times when a deviation from the use of the NOP date to establish the baseline is appropriate to present an accurate description of the expected environmental impacts of a proposed project.

This EIR evaluates impacts against existing conditions which are generally conditions existing at the time of the release of the NOP in December 2020. It was determined that a comparison to current, existing baseline conditions would provide the most relevant information for the public, responsible agencies and SJCOG decisionmakers. However, the release date of the NOP in December 2020 was during an unplanned global pandemic caused by the COVID-19 coronavirus. Beginning in March 2020, the SJCOG region was in varying stages of compliance with shelter-in-place orders directed by various county health officers. These orders modified commercial and office business operations,

employee commutes, and travel behavior, resulting in secondary effects related to vehicle miles traveled (VMT), air quality, and energy use.

As a result of the pandemic, there is insufficient transportation data to accurately establish measured or observed conditions for VMT and other transportation metrics, such as transit use, for baseline year 2020. Also, most pandemic orders, including shelter in place orders, have been lifted. Therefore, SJCOG's Regional Transportation Demand Model (RTDM) was utilized to model 2016 baseline conditions for these transportation metrics, as the model reflects more typical transportation patterns in the SJCOG region that would otherwise exist had the pandemic never occurred. For physical conditions that were not as altered by the pandemic and shelter-in-place orders, such as aesthetics, biological resources, and hydrology and water quality, the conditions for the analysis are generally as they existed in December 2020 and do not require modeling.

For some issue areas, this EIR also includes consideration of project effects against a forecast no project condition in addition to the current, existing, or modeled 2020 baseline conditions, controlling for impacts caused by population growth and other factors that would occur whether or not the 2022 RTP/SCS is adopted. This no project analysis is provided for informational purposes only. However, all impact determinations are based on a comparison to 2020 baseline conditions. Whenever this EIR refers to a baseline year, it refers to the modeled 2016 conditions or the 2020 conditions that generally existed unaltered by the COVID-19 pandemic.

3.4.3 Interim Timeframes

2046 is the horizon year of the 2022 RTP/SCS. While 2022 RTP/SCS would be implemented gradually over the planning period, this EIR does not analyze interim time frames because the four-year update cycle of the RTP/SCS prepared by SJCOG already requires short-term adjustments to the Plan. The one exception to this approach is in Section 4.7, *Greenhouse Gas Emissions/Climate Change*, which discusses years 2020, 2035, and 2046, as well as comparative baselines of 1990 and 2005, to satisfy statutory requirements and address state goals related to GHG emissions, such as SB 375 (Health & Safety Code, § 38551(b)). A summary of the scenarios considered in the GHG analysis is provided in Section 4.7.2 in Section 4.7, *Greenhouse Gas Emissions/Climate Change.*

3.4.4 Approach for Direct Impact Analysis

The programmatic nature of the 2022 RTP/SCS necessitates a general approach to the evaluation of existing conditions and impacts associated with the proposed project. As a programmatic document, this EIR presents a regionwide assessment of the impacts of the 2022 RTP/SCS. These impacts are examined for both transportation network improvements and the forecasted regional growth and land use changes. Because the EIR is a long-term document intended to guide actions over 25 years into the future, program-level and qualitative evaluation is involved. Quantitative analyses are provided where applicable with available information. During future stages in planning and implementation of specific elements of the 2022 RTP/SCS, including land development resulting from regional growth and transportation improvements identified in the 2022 RTP/SCS, project-specific CEQA documents will be prepared by the appropriate project implementation agency.

For analytical purposes, the baseline year examined throughout this EIR is 2020, except where specifically noted, as further described in Section 3.4.2 above.

3.4.5 Approach for Cumulative Analysis

CEQA defines cumulative impacts as "two or more individual effects which, when considered together, are considerable, or which can compound or increase other environmental impacts." Section 15130 of the CEQA Guidelines requires that an EIR evaluate environmental impacts that are individually limited but cumulatively considerable. These impacts can result from the proposed project alone, or together with other projects. The CEQA Guidelines state: "The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present and reasonably foreseeable probable future projects" (CEQA Guidelines, Section 15355). A cumulative impact of concern under CEQA occurs when the net result of combined individual impacts compounds or increases other overall environmental impacts (CEQA Guidelines, Section 15355). In other words, cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. CEQA does not require an analysis of incremental effects that are not cumulatively considerable nor is there a requirement to discuss impacts that do not result in part from the project evaluated in the EIR.

3.4.5.1 Cumulative Impact Methodology

Section 4 of this EIR includes an analysis of the proposed project's specific and cumulative impacts, as required by CEQA. The CEQA Guidelines require the analysis of the cumulative effects of a project in combination with other probable future projects. Section 15130 of the State CEQA Guidelines prescribes two methods for analyzing cumulative impacts: (1) use of a list of past, present, and reasonably anticipated future projects producing related or cumulative impacts; or (2) use of a summary of projections contained in an adopted general plan or related planning document.

This document is a Program EIR that analyzes the effects of the cumulative buildout of the 2022 RTP/SCS. The 2022 RTP/SCS considers the probable future projects described in method 1 above and includes a range of specific land use and transportation projects designed to meet the plan goals and current and projected future needs. The Draft EIR analyzes the cumulative impacts of these projects. The 2022 RTP/SCS also constitutes the cumulative scenario described in method 2. Therefore, the cumulative effects of all probable future circulation system improvements and land use projects in the region are included in the analysis of the proposed project's impacts. These projects are listed in Table 2-1 of this document and represent all reasonably foreseeable probable future transportation projects within San Joaquin County. Land use and growth projections for the region, which are the subject of analysis throughout this EIR, are combined with the growth projections for the adjoining counties and accounted for in SJCOG's traffic modeling. Adjoining counties are listed as follows: Contra Costa, Sacramento, Amador, Calaveras, Stanislaus, and Alameda.

The area that includes the SJCOG region and the adjoining counties is referred to in this analysis as the "cumulative impact analysis area." As shown in Table 3-1, the population for the adjoining counties is projected to grow by approximately 825,344 people by 2050.

Table 3-1 Population, Households and Employment Projections of Cumulative Impact Analysis Area, 2020-2050

	Population[2]		Households[2]		Jobs[2]	
Adjoining County	**2020**	**2050**	**2020**	**2050**	**2020**	**2050**
Contra Costa	1,156,787	1,330,012	393,100	441,800	683,800	837,400
Sacramento	1,568,626	1,937,854	532,500	673,600	1,279,100	1,559,500
Amador	37,928	44,867	14,800	16,400	23,530	29,603
Calaveras	44,255	36,164	19,200	20,800	17,998	21,236
Stanislaus	559,873	650,686	165,800	189,300	368,700	452,900
Alameda	1,680,246	1,873,476	572,800	662,800	1,485,600	1,827,300
Total	**5,047,715**	**5,873,059**	**1,698,200**	**2,004,700**	**3,858,728**	**4,727,939**

[1] Long-Term Socio Economic Forecasts by County, Department of Transportation, 2020

The RTP/SCS covers a 26-year period from 2020 to 2046 and is an update of the 2018 RTP/SCS. SJCOG does not propose any land use changes in the 2022 RTP/SCS, but rather the land use patterns envisioned by the 2022 RTP/SCS are based on the General Plan land use designations of the local agencies (the incorporated cities and the county). The forecasted allocations in the RTP are generally consistent with growth assumptions (e.g., location, density, and intensity of use) utilized in existing general plans or other local adopted plans; however, it does not utilize all available capacity in those plans.

Thus, the cumulative effects of all probable future circulation system improvements and land use projects in the region, as included in the SJCOG model, are included in the analysis of the proposed project's impacts. Therefore, in this chapter, when project-specific impacts are judged to be significant, they are also by definition considered "cumulatively considerable" incremental contributions to significant cumulative impacts (See CEQA Guidelines Section 15130(a)). Project-specific impacts assessed in this document represent the cumulative impact of all potential transportation and land use projects in the project area and surrounding regions as provided in the SJCOG model. Mitigation measures proposed for project-specific impacts also represent potentially feasible options for mitigating the proposed project's incremental contribution to significant cumulative effects (See CEQA Guidelines Section 15130(b)(5).).

In some cases, probable future projects outside the SJCOG region in neighboring counties would further contribute to significant cumulative impacts. These include the impacts of vehicle trips originating or terminating outside the region. Therefore, the 2022 RTP/SCS's traffic impact analysis includes the cumulative impact from these out-of-region trips as they are included in the traffic model the analysis is based on. The impacts of these external trips are also reflected in the EIR air quality, GHG, and energy impact analyses.

This page intentionally left blank.

4 Environmental Impact Analysis

This section discusses the possible environmental effects of the proposed project for the specific issue areas that were identified through the scoping process as having the potential to experience significant effects. A "significant effect" under *CEQA Guidelines* §15382, means:

> [A] substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment but may be considered in determining whether the physical change is significant.

The analysis of each issue area begins with a discussion of the environmental setting related to the issue, which is followed by the impact analysis. In the impact analysis, the first subsection identifies the methodologies used and the "significance thresholds," which are those criteria adopted by SJCOG and other agencies, universally recognized, or developed specifically for this analysis to determine whether potential effects are significant. For example, the County of San Joaquin utilizes the *San Joaquin County Environmental Thresholds and Guidelines Manual* (September 2020) for evaluating environmental impacts in the county. The next subsection describes each impact of the proposed project, mitigation measures for significant impacts, and the level of significance after mitigation. Each effect under consideration for an issue area is separately listed in bold text with the discussion of the effect and its significance. Each bolded impact statement also contains a statement of the significance determination for the environmental impact as follows:

- **Significant and Unavoidable**. An impact that cannot be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires a Statement of Overriding Considerations to be issued if the project is approved per §15093 of the CEQA Guidelines.
- **Less than Significant with Mitigation Incorporated**. An impact that can be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires findings under §15091 of the CEQA Guidelines.
- **Less than Significant**. An impact that may be adverse but does not exceed the threshold levels and does not require mitigation measures. However, mitigation measures that could further lessen the environmental effect may be suggested if readily available and easily achievable.
- **No Impact.** The proposed project would have no effect on environmental conditions or would reduce existing environmental problems or hazards.

Following each environmental impact discussion is a list of mitigation measures and the residual effects or level of significance remaining after implementation of the measure(s). In cases where the mitigation measure for an impact could have a significant environmental impact in another issue area, this impact is discussed and evaluated as a secondary impact. While SJCOG cannot mandate that other agencies implement the mitigation measures, ongoing interagency consultation during project specific environmental review process would ensure that mitigation contained herein is considered and implemented where applicable. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Many sections conclude with a screening-level discussion of specific 2022 RTP/SCS transportation projects that may result in identified impacts. The impact analysis concludes with a discussion of cumulative effects,

which are defined and discussed in detail in Section 3.0, *Environmental Setting and Impact Analysis Approach*.

Regarding Mandatory Findings of Significance under CEQA, Section 4.3, *Biological Resources*, describes the potential effects of the project on plant and animal species populations, habitats, communities, and migratory patterns. Section 4.4, *Cultural Resources*, describes potential effects from 2022 RTP/SCS on important historical and prehistorical cultural resources, and Section 4.15, *Tribal Cultural Resources*, describes potential effects from 2022 RTP/SCS on tribal cultural resources in the SJCOG region. As discussed in these sections, 2022 RTP/SCS would result in significant and unavoidable impacts on biological, cultural, and tribal cultural resources. Potential adverse environmental effects to human beings are discussed in Section 4.2, *Air Quality*, Section 4.12, *Land Use and Planning*, Section 4.13, *Noise*, Section 4.14, *Transportation*, Section 4.16, *Wildfire*, and Section 4.17, *Effects Considered Less than Significant*.

The *Executive Summary*, of this EIR, summarizes all impacts and mitigation measures that apply to the proposed project.

4.1 Visual Resources

This section evaluates potential impacts to visual resources from development facilitated by the proposed 2022 RTP/SCS.

4.1.1 Setting

a. Visual Character of the Region

The SJCOG region is within the greater San Joaquin Valley, with the Delta and vast, flat agricultural land and concentrated urban development framed by the foothills of the Diablo Range to the west and the foothills of the Sierra Nevada mountains to the east. Agricultural uses make up approximately 83 percent of the unincorporated lands within the SJCOG region (San Joaquin County 2014). Urban development is concentrated in the seven incorporated cities within the SJCOG region, primarily within the urban centers of Stockton, Manteca and Tracy.

Mature trees, development, utility structures, and other vertical forms are highly visible in the SJCOG region due to the flat terrain; however, where such vertical elements are absent, views are expansive. Much of the SJCOG region is developed at low densities with buildings not exceeding two stories, with the exception of urban centers within the incorporated cities. Large expanses of agricultural land are often broken up by small areas of scattered development. The aesthetic quality of the SJCOG region is altered by various forms of transportation, including highways, freeways, and transcontinental railroads.

The visual character of the SJCOG region consists of the following: the Delta, river corridors, agricultural lands and rangelands, significant oak groves, hillsides and ridges, and parklands (San Joaquin County 2014). The transportation network will be discussed further below in Primary Viewing Corridors.

The Delta

The Delta, a term applied to the greater Sacramento-San Joaquin River Delta, is the convergence of the Sacramento and San Joaquin Rivers. The Delta serves as a main deliverance for California's water system, with the State pumping fresh water from the Delta south to San Joaquin Valley farms and Southern California cities. A system of levees is interwoven throughout the Delta region, and much of the Delta are within the SJCOG region is used for agricultural production. The Delta is characterized by estuary habitat and marshlands that provide habitat to many birds, fish, and mammals. The Delta also serves as a source of recreation and unique scenery for boaters and fishermen throughout the SJCOG region.

River Corridors

The main waterways throughout the SJCOG region consist of the Stanislaus River, San Joaquin River, Mokelumne River, Dry Creek, and Old River. Many of these river corridors are lined with thick riparian vegetation, forming a strong visual contrast to adjoining agricultural and grazing lands. As such, these rivers provide visual resources within the SJCOG region.

Agricultural Lands and Rangelands

The SJCOG region includes large expanses of agricultural lands that are irrigated for row crops, vineyards, orchards, and field crops. These agricultural lands can take on visual characteristics such as fallow lands to vibrant fruit trees, depending on the season. Rolling hills in the eastern SJCOG region are composed of dry grasses that become green after winter and spring rains. Additionally, grazing occurs on flat agricultural lands and rolling hills throughout the SJCOG region.

Oak Groves

Oak groves are found in the southwestern corner of the SJCOG region, and scattered between the cities of Stockton and Lodi, as well as a small portion of the northeastern SJCOG region surrounding the Camanche Reservoir. The oak groves form a contrast to the majority grass-covered terrain.

Hillsides and Ridges

The foothills in the southwestern portion of the SJCOG region and along the eastern boundary add contrast to predominantly level terrain associated with agricultural operations and urbanized development. Hillsides are visible from numerous locations across the SJCOG region.

Parklands

There are many state and regional parks throughout the SJCOG region with many of these containing visual features such as oak groves and rivers. Parklands include the Carnegie State Vehicle Recreation Area, Caswell State Park, and local parks within incorporated cities.

b. Primary Viewing Corridors

There are two officially designated State Scenic Highways in the SJCOG region, according to the California Department of Transportation (Caltrans) California Scenic Highway Mapping System (Caltrans 2019):

- Interstate 580 (I-580) from the Interstate 5 (I-5) junction to the Alameda County Line
- I-5 from the Stanislaus County Line to I-580

An extension of the I-580 Scenic Highway is eligible for a Scenic Highway Designation:

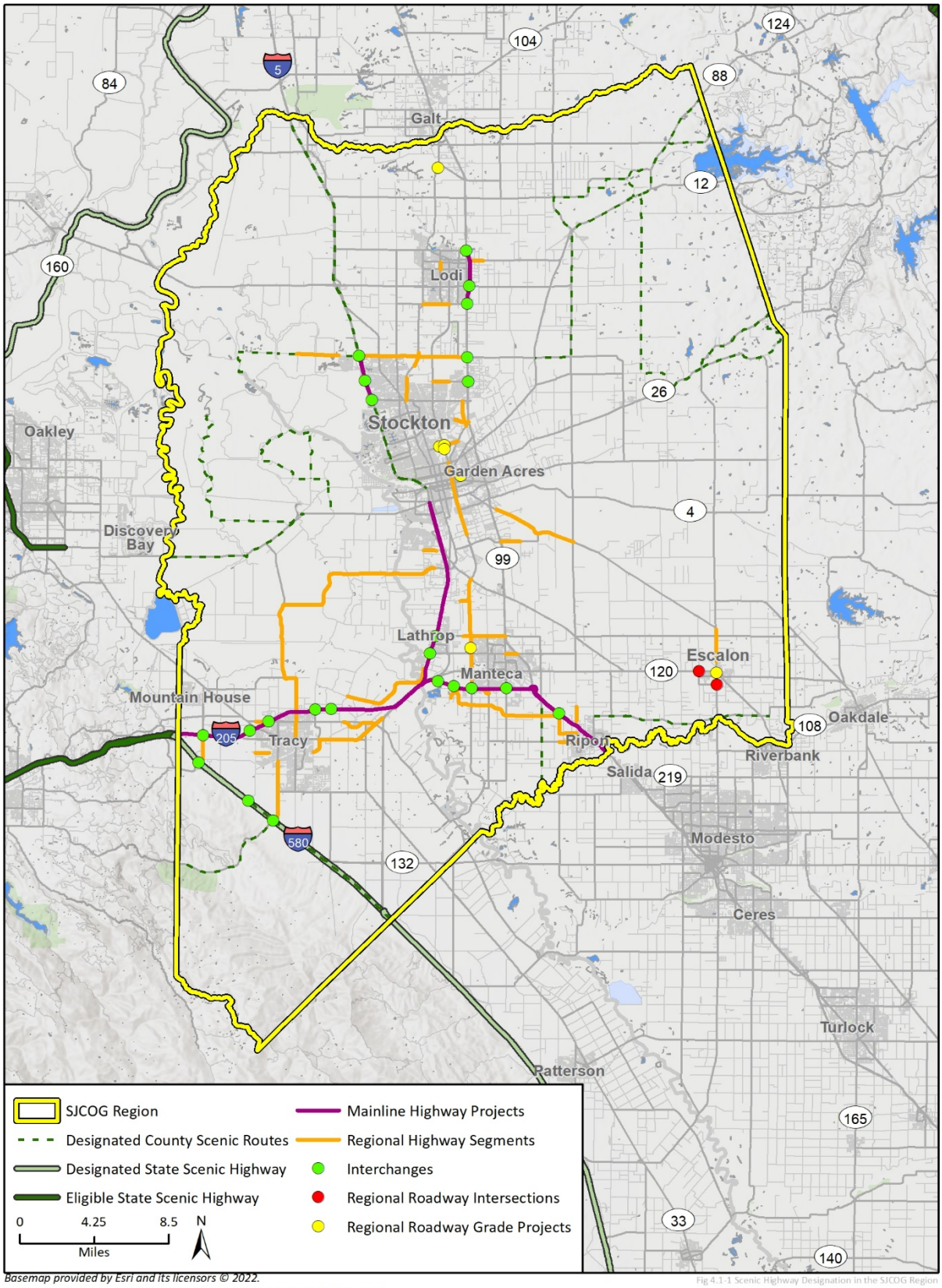
- I-580, from the I-5 Southwest of Vernalis/I-80 to the city of San Leandro in Alameda County

The I-580 to Alameda County Line Scenic Highway travels parallel to the foothills of the Diablo Range qualifying it as a scenic route. In addition to State designations, the San Joaquin County General Plan identifies the following 26 routes as County-designated local scenic routes (San Joaquin County 2016). Figure 4.1-1 depicts the location of these highways and routes.

- Liberty Road from State Route (SR) 88 to the Amador County Line
- Collier Road from Mackville Road to SR-88
- Mackville Road from SR-12/88 to Collier Road
- Jahan Road from Tully Road to Mackville Road
- Tully Road from Jahant Road to Peltier Road
- Peltier Road from Elliot Road to Tully Road
- Elliot Road from East Hammond Street to Peltier Road

- Jack Tone Road from Comstock Road to East Hammond Street
- Comstock Road from SR-88 to Jack Tone Road
- Clements Road from Comstock Road to SR-12/88
- Comstock Road from Clements Road to Fine Road
- Fine Road from SR-26 to Clements Road
- SR-26 from Fine Road to the Calaveras County Line
- Shelton Road from SR-26 to the Calaveras County Line
- I-5 from SR-4 to the Sacramento County Line
- Eight Mile Road from Empire Tract to Thornton Road
- Empire Tract Perimeter Roads from Eight Mile Road to Eight Mile Road
- Inland Drive from SR-4 to McDonald Road
- McDonald Road from Inland Drive to Neugebauer Road
- Neugebauer Road from McDonald Road to Holt Road
- Holt Road from Neugebauer Road to McDonald Road
- SR-4 from the Contra Costa County Line to Trappers Road
- Bacon Island Road from SR-4 to Connection Slough
- Corral Hollow Road from the Alameda County Line to I-580
- Austin Road from the Stanislaus County Line to SR-99
- River Road Ripon Road to Santa Fe Road

Figure 4.1-1 Scenic Roadways in the SJCOG Region



Basemap provided by Esri and its licensors © 2022.
Additional data provided by Caltrans, 2015; San Joaquin General Plan, 2016

Fig 4.1-1 Scenic Highway Designation in the SJCOG Region

4.1.2 Regulatory Setting

a. Federal Laws, Regulations, and Policies

National Scenic Byway Program

The National Scenic Byway Program was established to preserve and protect the nation's scenic and less-traveled roads in an effort to promote tourism. For designation as a National Scenic Byway a road must have one of the following six intrinsic qualities: scenic, natural, historic, cultural, archeological, or recreational. Within California, there are eight federally designated byways (FHWA 2021).

U.S. Department of Transportation Act, Section 4(f)

Section 4(f) of the Department of Transportation Act (DOT Act) of 1966 (49 U.S.C. § 303) was enacted to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges and historic sites. Section 4(f) requires a comprehensive evaluation of all environmental impacts resulting from federal-aid transportation projects administered by the Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and Federal Aviation Administration (FAA) that involve the use, or interference with use. Detailed inventories of the locations and likely impacts on resources that fall into the Section 4(f) category are required in project-level environmental assessments.

In August 2005, Section 4(f) was amended to simplify the process for approval or projects that have only minimal impacts on lands affected by Section 4(f). Under the new provisions, the U.S. Secretary of Transportation may find such a minimal impact if consultation with the State Historic Preservation Officer (SHPO) results in a determination that a transportation project will have no adverse effect on the historic site or that there will be no historic properties affected by the proposed action. In this instance, analysis of avoidance alternatives is not required, and the Section 4(f) evaluation process is complete.

b. State Laws, Regulations, and Policies

California Scenic Highway Program

Recognizing the value of scenic areas and view from roads in such areas, the State Legislature established the California Scenic Highway Program in 1963 (Streets and Highways Code Sections 260 et seq). This legislation preserves and protects scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to highways. The goal of the Scenic Highway Program is to preserve and enhance the natural beauty of California. Under this program, a number of State Routes have been designated as eligible for inclusion as scenic routes. Once the local jurisdiction through which the roadway passes have established a corridor protection program and the Departmental Transportation Advisory Committee recommends designation of the roadway, the State may officially designate roadways as scenic routes. Interstate highways, State Routes and county roads may be designated as scenic under the program. The Master Plan of State Highways Eligible for Official Scenic Highway Designation maps designated highway segments, as well as those that are eligible for designation. Changes to the map require an act of the State Legislature.

As noted, a corridor protection program must be adopted by the local governments with land use jurisdiction over the area through which the roadway passes as the first step in moving a road from "eligible" to "designated" status. Each designated corridor is monitored by the State and

designation may be revoked if a local government fails to enforce the provisions of the corridor protection program. While there are no restrictions on scenic highway projects, local agencies and the California Department of Transportation (Caltrans) must together to coordinate transportation and development projects and ensure the protection of the corridor's scenic value to the greatest extent possible, including undergrounding all visible electric distribution and communication utilities within 1,000 feet of a Scenic Highway. In some cases, local governments have their own land use and site planning regulations in place to protect scenic values along a designated corridor. At a minimum, each corridor protection program must include:

- Regulation of land use and density of development,
- Detailed land and site planning,
- Control of outdoor advertising devices,
- Control of earthmoving and landscaping and
- Regulation of the design and appearance of structures and equipment.

The Master Plan of State Highways Eligible for Official Scenic Highway Designation requires that proposed realignments and route improvements be evaluated for their impact on the scenic qualities of the corridor. The SJOCG area includes designated and eligible State Scenic Highways, as seen in Figure 4.1-1.

Caltrans Corridor Highway Program

Caltrans offers cities and counties a nomination process for eligible scenic highways to become officially designated. The jurisdiction must identify and define the scenic corridor of the highway. Scenic corridors are defined as corridors that possesses highly scenic and natural features, as viewed from the highway. Topography, vegetation, viewing distance, and/or jurisdictional lines determine the corridor boundaries. The CPP summarizes the city or county ordinances, zoning and/or planning policies (collectively called "visual quality protection measures") that preserve the scenic quality of the corridor. The visual quality protection measures and the CPP should be written in sufficient detail as to avoid broad discretionary interpretation; and need to demonstrate a concise strategy to effectively maintain the scenic character of the corridor. If the visual quality protection measures do not already exist at that local level, additional protection measures would need to be adopted by the local government(s) in order to fulfill the five elements required by legislation defined in the Streets and Highways Code.

The five elements include five legislatively required areas:

1 Regulation of land use and density of development;
2 Detailed land and site planning;
3 Control of outdoor advertising;
4 Careful attention to and control of earthmoving and landscaping; and
5 The design and appearance of structures and equipment.

California Building Energy Efficiency Standards

California Code of Regulations Title 24, Part 6 contains California's Energy Efficiency Standards for Residential and Non-residential Buildings. California Building Energy Efficiency Standards were established by CEC in 1978 in response to a legislative mandate to create uniform building codes to reduce California's energy consumption and provide energy efficiency standards for residential and

nonresidential buildings. The 2019 Energy Code contains standards to reduce energy consumption for outdoor lighting application in residential and non-residential developments. Mandatory measures for outdoor lighting and glare are specified in §110.9, §130.0, and §130.2 of the 2019 Energy Code.

Caltrans Adopt-a-Highway Program

To improve and maintain the visual quality of California highways, Caltrans administers the Adopt-a-Highway program, which was established in 1989. The program provides an avenue for individuals, organizations, or businesses to help maintain sections of roadside within California's State Highway System. Groups have the option to participate as volunteers or to hire a maintenance service provider to perform the work on their behalf. Adoptions usually span a two-mile stretch of roadside, and permits are issued for five-year periods. Since 1989, more than 120,000 California residents have kept 15,000 shoulder miles of state roadways clean by engaging in litter removal, tree and flower planting, graffiti removal and vegetation removal.

c. Regional and Local Laws, Regulations, and Policies

San Joaquin County General Plan

The San Joaquin County General Plan, Natural and Cultural Resource Element Goal NCR-7 sets out to protect and enhance the unique scenic features of San Joaquin County. To do so, the following policies are included (San Joaquin County 2016).

- NCR-7.1: The County shall protect the visual character of designated scenic roadways
- NCR-7.2: The County shall ensure that views of waterways, hilltops, and oak groves from public land and public roadways are protected and public access is provided to them whenever possible.
- NCR-7.3: The County shall preserve scenic views from roadways by designating scenic routes based on the following criteria:
  - Leads to a recreational area;
  - Provides a representative sampling of the scenic diversity within the County;
  - Exhibits unusual natural or man-made features of interest;
  - Provides opportunities to view activities outside the normal routine of most people;
  - Provides a route for people to view the Delta waterways; and
  - Links two scenic routes or connects with scenic routes of cities or other counties.
- NCR-7.4: The County shall require new development adjacent to scenic resources to be sited and designed to visually complement those resources, except in MR-Z designated areas.
- NCR-7.5: The County shall require landscape plans for new development along State- or County-designated scenic routes.
- NCR-7.6: The County shall ensure that ridgelines and major hill tops remain undeveloped.
- NCR-7.7: The County shall encourage project designs, lighting configurations, and operational practices that reduce light pollution and preserve view of the night sky.
- NCR-7.8: The County shall require all new electric and communication distribution facilities adjacent to scenic routes to be placed underground, whenever feasible. Where overhead utility

lines are unavoidable, every effort should be made to reduce the visual impacts through elements of design.

City General Plans and Regulations

City of Escalon General Plan

The City of Escalon General Plan Community Design Element addresses the conservation and enhancement of the visual quality of the Escalon environment. The Community Design Element specifically addresses the protection of natural resources, preservation and enhancement of the historical character of the community, the incorporation of new development into existing public and private development, and the maintenance of a small-town, rural atmosphere. Policies and Standards specifically related to aesthetics include preservation of the Sierra Nevada and foothill views from the City of Escalon's major roadways, and the implementation of a special design overlay for the State Highway 120 corridor (City of Escalon 2019).

City of Lathrop Comprehensive General Plan

The City of Lathrop Comprehensive General Plan includes policies to assure quality in aesthetic characteristics of new development. To achieve this, the Comprehensive General Plan implements policies which require land use designations along freeway section to take visual impacts into consideration, require the inclusion of bodies of water as components of urban development, require outdoor storage areas to be visually screened, and implements a landscaped buffer strip along freeways for visual screening (City of Lathrop 1991). The city is currently undergoing a general plan update expected to be completed later this year.

City of Lodi General Plan

The City of Lodi General Plan aims to maintain its small-town atmosphere and provide compact urban form, promoting infill development downtown and along key corridors. Policies within the Community Design & Livability chapter emphasize maintaining the visual character of the City of Lodi. Policy CD-P27 requires new development to exhibit architectural variety and visual interest. Policy CD-P28 implements methods to minimize the visual impacts of automobiles in residential areas including reducing garage frontage, minimizing curb cuts, and providing narrow roads. Policy P-P11 of the Parks, Recreation, and Open Space Chapter of the General Plan encourages planting of native trees, shrubs, and grassland to preserve the visual integrity of the landscape (City of Lodi, 2010).

City of Manteca General Plan

The City of Manteca General Plan 2023 Community Design Element contains policies that are used to maintain the visual character of the city. Policy CD-P-9 requires the design standards for Yosemite Avenue and Main Street as a means of visually upgrading commercial development along these streets. Policy CP-P-10 requires the establishment of gateway features at intersection such as Lathrop Road and SR-99, or Yosemite Avenue and SR-99. Policy CD-P-11 requires the establishment of a landscape program and design standards that provide views of the city along SR-99 and SR-120 (City of Manteca 2003). The city is currently undergoing a general plan update expected to be completed later this year.

City of Ripon General Plan

The City of Ripon General Plan Circulation and Transportation Chapter has the goal of providing a circulation system correlated with existing and proposed land used that contributes to efficient and safe movement of persons, good, and services within and through Ripon. To fulfil this goal, Policy A4 is included which states the City of Ripon will consider visual aesthetics and safety aspects in future developments, including landscaping requirements and setback requirements (City of Ripon 2006).

City of Stockton General Plan

The City of Stockton Envision Stockton 2040 General Plan Land Use Element Policy LU-1.3 aims to improve the visual quality of the urban environment to be more welcoming and inviting at key gateway and travel corridors into the city. Actions LU-1.3A through LU-1.3C implement Policy LU-1.3 by creating a "gateway district" program for major corridor entries, collaborating with transportation agencies to improve maintenance, code enforcement, screening, and landscaping of viewsheds along rail corridors, Highway 99, Highway 4, and Interstate 5, and requiring the incorporation of scenic views into design of the built environment (City of Stockton 2018).

City of Tracy General Plan

The City of Tracy General Plan Land Use Element contains policies specific to transportation corridors in the city. Specifically, the Land Use Element states special attention should be given to areas around the Interstate 205 off-ramps to ensure development is visually attractive. Appropriate setbacks and landscaping along Interstate 205 shall be provided to create an aesthetically pleasing visual entryway into the City of Tracy. Setbacks and landscaping shall also be required along the Eleventh Street edge of the Urban Reserve 4 boundary of the City of Tracy (City of Tracy 2011).

4.1.3 Impact Analysis

a. Methodology and Significance Thresholds

Environmental assessment of a proposed project's impacts to the aesthetic and visual resources of a site begins with identification of the existing visual resources on and off that site, including the site's physical attributes, its relative visibility, and its relative uniqueness. The assessment of aesthetic impacts involves qualitative analysis that is inherently subjective in nature. Different viewers react to viewsheds and aesthetic conditions differently. This evaluation measures the existing visual resource against the proposed action, analyzing the nature of the anticipated change.

It is important to distinguish between public and private views. Private views are those views seen from privately-owned land, including views from private residences and are typically enjoyed by individuals. Public views are experienced by the collective public. These include views of significant landscape features such as the Sierra Nevada Mountain range, as seen from public viewing space, not privately-owned properties. California Environmental Quality Act (CEQA) (PRC §21000 et seq.) case law has established that only public views, not private views, need be analyzed under CEQA. See Association for Protection etc. Values v. City of Ukiah (1991) 2 Cal. App. 4th 720 and Topanga Beach Renters Assn. v. Department of General Services (1976) 58 Cal. App. 3d 188. Therefore, for this analysis, only public views will be considered when analyzing the visual impacts of implementing the proposed 2022 RTP/SCS.

Appendix G of the State CEQA Guidelines identifies the following criteria for determining whether a project's impacts would have a significant impact related to visual resources:

1 Have a substantial adverse effect on a scenic vista.

2 Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

3 In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site or its surroundings; if the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality; or

4 Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with transportation projects and the land use scenario contained within the proposed 2022 RTP/SCS. Section 4.1.3.c summarizes the impacts associated with capital improvement projects proposed in the 2022 RTP/SCS. Due to the programmatic nature of the proposed 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1:	Have a substantial adverse effect on a scenic vista
Threshold 2:	Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway

Impact AES-1 **THE PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD HAVE A SUBSTANTIAL ADVERSE EFFECT ON SCENIC VISTAS AND SUBSTANTIALLY DAMAGE SCENIC RESOURCES WITHIN A STATE SCENIC HIGHWAY. IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.**

As discussed previously, there are two officially designated state scenic highways and numerous County-designated scenic routes in the SJCOG region. Visual resource impacts from construction on or adjacent to these roadways would include: blockage of views by construction equipment and staging areas; disruption of views by temporary signage; and exposure of slopes and removal of vegetation. These effects would be temporary during the construction phase.

In the long-term, implementation of the proposed 2022 RTP/SCS would generally result in modification of existing transportation facilities within existing highway, roadway, or railroad rights-of-way. Further, many of the proposed projects are at-grade with the surrounding environment. As such, most of the road and highway investments are not likely to result in massive obstructions or blockages of surrounding views nor modify or substantially alter existing scenic resources viewed from a scenic vista or state scenic highway.

Similarly, land use development envisioned by the proposed 2022 RTP/SCS would be focused primarily in urban infill areas. Scenic vistas and designated scenic highways are generally located in undeveloped, rural areas, such that most future land use development envisioned in the proposed 2022 RTP/SCS would be unlikely to block or substantially alter scenic vistas.

While most transportation and land use projects would not result in significant impacts to scenic vistas or scenic resources within a state scenic highway, some projects have the potential to result

in substantial adverse effects. For example, interchange projects would occur on I-580, a designated scenic highway. These projects would change existing visual conditions of the area within which they are proposed through modification or removal of existing vegetation or the introduction of new structures that could block existing views from the roadway. In some areas, higher density infill development would obstruct scenic views of the Sierra Nevada Mountain range or foothills.

Both the proposed transportation and land use development near state-designated scenic highway corridors would be minimized to some extent through compliance with the Caltrans Corridor Protection Program, which requires that the local jurisdiction adopt ordinances, zoning and/or planning policies to preserve the scenic quality of the state-designated scenic highway corridor or document such regulations that already exist in various portions of local codes. Many local jurisdictions also have their own general plan policies related to the protection of scenic vistas and resources such as Action LU-1.3C in the Envision Stockton 2040 General Plan which requires incorporation of scenic views into design of the built environment. These policies would limit the amount or type of development in designated in scenic corridors or require special design guidelines when developing in certain areas. However, because scenic vistas and scenic resources are protected unevenly amount the various jurisdictions in the SJCOG region, the proposed 2022 RTP/SCS would result in a substantial adverse effect on a scenic vista or substantially damage scenic resources within a state scenic highway.

Similarly, the future land use scenario envisioned by the proposed 2022 RTP/SCS is intended to encourage in-fill development and development near existing transportation corridors. This type of development would help to avoid the loss of scenic resources overall by concentrating development within existing urbanized areas when compared to a future scenario without the proposed 2022 RTP/SCS. This land use scenario would intensify the built environment within existing urban areas through planned in-fill development. In addition, this land use scenario would concentrate development near transportation corridors in urban areas, which would further increase the visibility of future in-fill and transit-oriented development from these corridors and potentially impact views of background scenic resources. However, not all projects and development included in the proposed 2022 RTP/SCS would be infill projects in urbanized areas, and some projects would inevitably be located in rural and other areas in the SJCOG region. Therefore, the proposed 2022 RTP/SCS could also result in a substantial adverse effect on a scenic vista or substantially damage scenic resources within an eligible scenic highway or a locally identified scenic highway in rural areas of the SJCOG region. The following mitigation measures would reduce this impact.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures where applicable for transportation projects implementing the proposed 2022 RTP/SCS that would result in impacts to scenic vistas and resources. Cities and the County can and should implement these measures, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site specific conditions.

AES-1(a) Tree Protection and Replacement

Implementing agencies shall, or can and should, ensure new roadways, extensions and widenings of existing roadways, bridge replacement and enhancements, trails and facility improvement projects shall avoid the removal of existing mature trees to the extent possible consistent with adopted local

City and County policies as applicable. The implementing agency of a particular proposed 2022 RTP/SCS project shall replace any trees lost at a minimum 2:1 basis and incorporate them into the landscaping design for the roadway when feasible, or as required by local or County requirements. The implementing agency also shall ensure the continued vitality of replaced trees through periodic maintenance.

AES-1(b) Discouragement of Architectural Features that Block Scenic Views

Implementing agencies shall, or can and should, design projects to minimize contrasts in scale and massing between the project and surrounding natural forms and development. Setbacks and acoustical design of adjacent structures shall be preferentially used as mitigation for potential noise impacts arising from increased traffic volumes associated with adjacent land development. The use of sound walls, or any other architectural features that could block views from the scenic highways or other view corridors, shall be discouraged to the extent possible. Where use of sound walls is found to be necessary, walls shall incorporate offsets, accents and landscaping to prevent monotony. In addition, sound walls shall be complementary in color and texture to surrounding natural features.

IMPLEMENTATION AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. These mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate.

Significance After Mitigation

Although identified mitigation would help reduce impacts related to state-designated scenic highway corridors and scenic resources, individual transportation infrastructure projects as well as land use development included in the proposed 2022 RTP/SCS could still result in obstructions to panoramic views and views of important landscape features or landforms (mountains, wetlands, rivers, or important man-made structures) as seen from public viewing areas. And because this EIR evaluates impacts at the programmatic level, all project circumstances are not foreseeable, and these mitigation measures may not be feasible or effective for some projects. Therefore, given the extent of planned land use development and the potential for site-specific visual obstructions from future land use and transportation projects, impacts related to the obstruction of scenic areas from public viewing areas and impacts to state-designated scenic highway corridors and scenic resources would be significant and unavoidable. No additional mitigation measures to reduce this impact to less-than-significant levels are feasible.

Threshold 3:	In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site or its surroundings; in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality

THE PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD IN NON-URBANIZED AREAS, SUBSTANTIALLY DEGRADE THE EXISTING VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OR THE SITE OR ITS SURROUNDINGS; IN AN URBANIZED AREA, CONFLICT WITH APPLICABLE ZONING AND OTHER REGULATIONS GOVERNING SCENIC QUALITY. IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.

Impact AES-2

The proposed 2022 RTP/SCS includes improvements to existing facilities such as road widenings, intersection or interchange improvements, railroad crossing safety, highway maintenance and other improvements. The proposed 2022 RTP/SCS would include some new road and highway facilities such as new interchanges, new roadways and overcrossings and road extensions. Most road and highway projects would occur in areas where transportation is already a dominant feature of the landscape and therefore would not likely degrade the existing visual character of the region. In less developed areas of the region, adding new transportation infrastructure would alter the character of previously undeveloped lands, particularly those in unincorporated San Joaquin County, by introducing more paved surfaces than what already exists. Ancillary facilities constructed along new or existing roads, such as lighting, bus shelters, and signs, would further contribute to the trend toward a more suburban visual character. A complete listing of transportation projects with the potential to alter the rural character of the SJCOG region is included in Table 4.1-1.

The proposed 2022 RTP/SCS emphasizes infill development and development near existing transportation corridors, which are generally located in urbanized areas of cities and unincorporated communities. Infill development can be favorable in terms of visual character, as it occurs in areas already designated for and receiving growth and precludes growth in undeveloped and/or agricultural and rural uses.

However, when compared to existing conditions, the proposed 2022 RTP/SCS land use scenario would intensify the built environment within existing urban areas through the implementation of infill and transit-oriented development (TOD) projects, thereby resulting in an overall change in the character of existing urbanized areas to a denser development pattern that could conflict with applicable zoning and other regulations governing scenic quality. For example, development along Interstate 205 in the city of Tracy would result in a built environment that could conflict with the City of Tracy General Plan goals to create an aesthetically pleasing visual entryway into its city limit. In addition, land use projects that would occur in rural or agricultural areas would introduce urban development to areas that were previously undeveloped. Depending on the design and siting of these projects, the resulting change would degrade the visual character or quality of their surroundings. Some projects would inevitably be located in the more rural areas of the SJCOG region surrounding Escalon, and to the north of Tracy and southeast of Stockton.

Projects implemented under the proposed 2022 RTP/SCS would be subject to existing regulations that would help to minimize impacts to visual character. For example, in visually sensitive areas, local land use agencies would apply development standards and guidelines to maintain compatibility with surrounding natural areas, including site coverage, building height and massing, building materials and color, landscaping and site grading. Nevertheless, even with compliance with these standards, the overall visual effect of planned roadway projects and envisioned land use projects would contribute to an incremental, but irreversible transformation in visual character from rural or semi-rural to more urban or suburban throughout the SJCOG region. Therefore, the impact

of visual character resulting from implementation of the proposed 2022 RTP/SCS would be significant. The following mitigation measures would reduce this impact.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures where applicable for transportation projects implementing the proposed 2022 RTP/SCS that would result in impacts to visual character. Cities and the County can and should implement these measures, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site specific conditions.

AES-2 Design Measures for Visual Compatibility

The implementing agency shall, or can and should, require measures that minimize contrasts in scale and massing between the project and surrounding natural forms and developments. Strategies to achieve this include:

- Siting or designing projects to minimize their intrusion into important viewsheds;
- Avoiding large cuts and fills when the visual environment (natural or urban) would be substantially disrupted;
- Ensuring that re-contouring provides a smooth and gradual transition between modified landforms and existing grade;
- Developing transportation systems to be compatible with the surrounding environments (e.g., colors and materials of construction material; scale of improvements);
- Designing and installing landscaping to add natural elements and visual interest to soften hard edges, as well as to restore natural features along corridors where possible after widening, interchange modifications, re-alignment, or construction of ancillary facilities. The implementing agency shall provide a performance security equal to the value of the landscaping/irrigation installation to ensure compliance with landscaping plans; and
- Designing new structures to be compatible in scale, mass, character, and architecture with existing structures.

IMPLEMENTATION AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate.

Significance After Mitigation

Implementation of mitigation measures AES-2 would reduce project -specific impacts to the extent feasible. Mitigation Measure AES-1(a) and AES-1(b), discussed above for Impact AES-1, would also reduce impacts associated with visual character. Nevertheless, the incremental alteration of current rural or semi-rural character to a more suburban environment is considered a significant and unavoidable impact because mitigation measure may not be feasible for all projects. No additional mitigation measures to reduce this impact to less than significant levels are feasible.

Threshold 4:	Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area

THE PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD RESULT IN NEW SOURCES OF SUBSTANTIAL LIGHT OR GLARE THAT WOULD ADVERSELY AFFECT DAYTIME OR NIGHTTIME VIEW IN THE AREA. IMPACTS ARE SIGNIFICANT AND UNAVOIDABLE.

Impact AES-3 Existing sources of light and glare within the SJCOG region are primarily focused in cities, towns, and other urban development boundary areas. New or intensified lighting from land use development envisioned in the proposed 2022 RTP/SCS, which is focused on infill and TOD development, would be concentrated in areas with existing sources of light and glare. In these infill areas, such increases may not adversely affect nighttime views because existing sources of light, glare, and shadow are already a dominant feature of the urban landscape. However, the intensity of light and glare in these urban areas would increase as a result of infill and TOD projects under the proposed 2022 RTP/SCS, depending on site specific conditions and lighting design associated with new structures. Additionally, interchange construction and improvement projects in rural areas could increase lighting in rural areas that are characterized by dark night skies. Exterior lighting in some areas would be limited by compliance with existing lighting regulations, as discussed in Section 4.1.2, *Regulatory Setting*.

Improvements to existing roadways and highways would not significantly increase the amount of light and glare in an area, as these improvements would take place on existing facilities that have existing sources of light and glare. Increases in light and glare from new reflective signage, streetlights, intersection control devices, and other improvements would be relatively minor compared to existing conditions. However, the expansion of existing roadways or construction of new roadways would allow a greater volume of vehicles to travel through a given segment of roadway or highway throughout the day, or introduce vehicles into a new area, which would have the potential to introduce new or additional vehicle headlights as new light sources. In addition, some of the projects included in the proposed 2022 RTP/SCS would directly introduce light, including the construction and improvement of bus and transportation facilities, installation of traffic signals, and construction of lighting along bike paths. The introduction of light and glare could adversely affect daytime or nighttime views.

Overall, light and glare impacts from transportation improvements and infill and TOD development envisioned under the proposed 2022 RTP/SCS would be significant because there would be new sources of substantial light or glare. The following mitigation measures would reduce this impact.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures where applicable for transportation projects implementing the proposed 2022 RTP/SCS that would result in impacts to daytime or nighttime views. Cities and the County can and should implement these measures, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site specific conditions.

AES-3(a) Roadway Lighting

Implementing agencies shall, or can and should, minimize roadway lighting to the extent possible, consistent with safety and security objectives, and shall not exceed the minimum height requirements of the local jurisdiction in which the project is proposed. This may be accomplished through the use of back shields, hoods, low intensity lighting, and using as few lights as necessary to achieve the goals of the project.

AES-3(b) Lighting Design Measures

As part of planning, design, and engineering for projects, project sponsors shall, or can and should, ensure that projects proposed near light-sensitive uses avoid substantial spillover lighting. Potential design measures include, but are not limited to, the following:

- Lighting shall consist of cutoff-type fixtures that cast low-angle illumination to minimize incidental spillover of light into adjacent properties and undeveloped open space. Fixtures that project light upward or horizontally shall not be used.
- Lighting shall be directed away from habitat and open space areas adjacent to the project site.
- Light mountings shall be downcast, and the height of the poles minimized to reduce potential for backscatter into the nighttime sky and incidental spillover of light onto adjacent private properties and undeveloped open space. Light poles will be 20 feet high or shorter. Luminary mountings shall have non-glare finishes.
- Exterior lighting features shall be directed downward and shielded in order to confine light to the boundaries of the subject project. Where more intense lighting is necessary for safety purposes, the design shall include landscaping to block light from sensitive land uses, such as residences.

AES-3(c) Glare Reduction Measures

Implementing agencies shall, or can and should, minimize and control glare from transportation and land use projects near glare-sensitive uses through the adoption of project design features such as:

- Planting trees along transportation corridors to reduce glare from the sun;
- Creating tree wells in existing sidewalks;
- Adding trees in new curb extensions and traffic circles;
- Adding trees to public parks and greenways;
- Landscaping off-street parking areas, loading areas, and service areas;
- Limiting the use of reflective materials, such as metal;
- Using non-reflective material, such as paint, vegetative screening, matte finish coatings, and masonry;
- Screening parking areas by using vegetation or trees;
- Using low-reflective glass; and
- Complying with applicable general plan policies, municipal code regulations, city or local controls related to glare
- Tree species planted to comply with this measure shall provide substantial shade cover when mature. Utilities shall be installed underground along these routes wherever feasible to allow trees to grow and provide shade without need for severe pruning.

IMPLEMENTATION AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate.

Significance After Mitigation

In the absence of regulations specifically addressing light and glare impacts, the aforementioned mitigation measures would limit the use of reflective building materials and the potential spillage of light both upward and onto adjacent properties from exterior lighting fixtures. However, mitigation measures maybe not be feasible for all projects. Therefore, this impact would remain significant and unavoidable.

c. Specific Projects That May Result in Impacts

Table 4.1-1 identifies proposed 2022 RTP/SCS projects that may result in impacts to visual resources as discussed above. Given the large number of projects envisioned across the SJCOG region in the proposed 2022 RTP/SCS, the table shows a representative rather than comprehensive list of projects that would generate these impacts. Listed projects are representative of the types of impacts and the types of projects that could be affected in different localities. Mitigation measures discussed above would apply to these specific projects as well as any other proposed 2022 RTP/SCS projects that would result impacts to visual resources.

Table 4.1-1 Proposed 2022 RTP/SCS Projects that May Result in Visual Resource Impacts

Project Jurisdiction and Location	Improvement	Potential Impact
Caltrans		
On SR-120 from Main Street (P.M. 5.13) to SR-99 and on SR-99 from SR-120 to Olive Avenue (P.M. 6.22)	(Widen the eastbound SR 120 to southbound SR 99 connector ramp from one-lane to two-lanes; Remove the Austin Road overcrossing and replace with a new 4 lane structure spanning SR 99 and UPRR; Add a new connecting road from Austin Road to Woodward Ave and Moffat Blvd and modify the existing UPRR gated crossing at Woodward Ave;Temporarily close the Austin Road northbound entrance and southbound exit ramps, resulting in a partial interchange.)	AES-1, AES-2, AES-3
Alameda County Line to Eleventh Street	Widen from 6 to 8 lanes (inside/outside)	AES-1, AES-2, AES-3
Eleventh Street to MacArthur Drive	Widen from 6 to 8 lanes (inside/outside)	AES-1, AES-2, AES-3
MacArthur Drive to I-5	Widen from 6 to 8 lanes (inside/outside)	AES-1, AES-2, AES-3
I-205 to Louise Avenue (P.M. 12.5/R 16.5)	Widen to add HOV lanes with HOV Connector Ramps to I-205 and SR-120	AES-1, AES-2, AES-3
I-5 to Main Street (P.M. 5.13)	Widen 4 to 6 lanes (inside)	AES-1, AES-2, AES-3
SR-120 to Stanislaus County Line	Widen 6 to 8 lanes (inside/outside), including reconstruction of SR-99/Main Street and SR-99/Wilma Avenue interchanges and pedestrian overcrossing	AES-1, AES-2, AES-3

Project Jurisdiction and Location	Improvement	Potential Impact
On SR-120 from Main Street (P.M. 5.13) to SR-99 and on SR-99 from SR-120 to Olive Avenue (P.M. 6.22)	Widen the northbound SR 99 to westbound SR 120 connector ramp from one-lane to two-lanes; Add an auxiliary lane in the existing median of westbound SR 120 from Main Street to SR 99; Convert the existing 99/120 separation structure to two lanes and construct a new separation structure to serve the eastbound 120 to northbound 99 connector ramp.)	AES-1, AES-2, AES-3
Hammer Lane to North of Eight Mile Road	Widen from 6 to 8 lanes (inside median) including auxiliary lanes	AES-1, AES-2, AES-3
French Camp Road to Charter Way	Widen 6 to 8 lanes (inside)	AES-1, AES-2, AES-3
Louise Avenue to French Camp Road	Widen 6 to 8 lanes (inside)	AES-1, AES-2, AES-3
On SR-120 from Main Street (P.M. 5.13) to SR-99 and on SR-99 from SR-120 to Olive Avenue (P.M. 6.22)	Add braided off ramps from SR 99 and SR 120 to Austin Road; Add loop on ramp from Austin Road to northbound SR 99 and to westbound SR 120; Add auxiliary lane on eastbound SR 120 from Main Street to SR 99; Add an auxiliary lane in each direction on SR 99 from SR 120 to approximately 1.7 mile south of Austin Road and relocate the frontage road.	AES-1, AES-2, AES-3
Harney Lane to Turner Road	Widen 4 to 6 lanes (inside)	AES-1, AES-2, AES-3
City of Escalon		
Intersection of Ullrey Avenue and McHenry Avenue including UPRR railroad crossing.	Reconstruct intersection, including addition of turn pockets, improvement of traffic signal and installation of train pre-emption system for UPRR railroad crossing.	AES-1, AES-2, AES-3
City of Lathrop		
I-5 at Louise Avenue	Reconstruct interchange (PM 16.4-16.8)	AES-1, AES-2, AES-3
I-5 at Lathrop Road	Reconstruct interchange (P.M. 17.3/17.8)	AES-1, AES-2, AES-3
SR 120 at Yosemite Ave/Guthmiller Road	Reconstruct interchange	AES-1, AES-2, AES-3
Along Northwest side of I-5 from Brookhurst Blvd to Stewart Road	Construct new roadway parallel to I-5, 2 lanes from Brookhurst Blvd to Stewart Road	AES-1, AES-2, AES-3
Along Northwest side of I-5 from Stewart Road to Paradise Road	Construct new roadway parallel to I-5, 4 lanes from Stewart Road to Paradise Road	AES-1, AES-2, AES-3
Along Northwest side of I-5 from Brookhurst Blvd to Stewart Road	Widen from 2 to 4 lanes, from Brookhurst Blvd to Stewart Road	AES-1, AES-2, AES-3
City of Lodi		
SR-99 at SR-12 West (Kettleman Lane)	Reconstruct interchange and widen to free-flowing interchange	AES-1, AES-2, AES-3
SR-99 at Harney Lane	Reconstruct interchange to provide 6 through lanes on SR 99, 4 lanes on Harney between Reynolds Ranch Pkwy and SR 99 and modify on-ramps and off-ramps	AES-1, AES-2, AES-3
SR-99 at Turner Road	Reconstruct interchange to provide operational and safety improvements on SR 99 at Turner Road (PM 31.3/31.6)	AES-1, AES-2, AES-3
Hutchins Street to Lower Sacramento Road	Widen from 2/3 lane collector to 4 lane divided arterial	AES-1, AES-2, AES-3

Project Jurisdiction and Location	Improvement	Potential Impact
Between SR 99 to Central California Traction railroad tracks.	Widen from 2 to 4 lanes. Add center dual left turn lane, turn pockets at intersections and median separation with landscape	AES-1, AES-2, AES-3
From Lodi Avenue to Elm Street	Widen 2/3 lanes to 4 lanes	AES-1, AES-2, AES-3
City of Manteca		
SR-120 at McKinley Avenue	Construct new interchange	AES-1, AES-2, AES-3
SR-120 at Airport Way	Reconstruct interchange	AES-1, AES-2, AES-3
SR-120 at Main Street	Reconstruct interchange	AES-1, AES-2, AES-3
SR-99 at Raymus Expressway	Construction of new interchange	AES-1, AES-2, AES-3
East of Airport Way to Union Road	Construct new 4 lane roadway (gap closure)	AES-1, AES-2, AES-3
SR-120 to Yosemite Ave.	Widen from 2 to 4 lanes	AES-1, AES-2, AES-3
Lathrop Road to Roth Road	Widen from 2 to 4 lanes	AES-1, AES-2, AES-3
Main Street to SR-99	Widen from 2 to 4 lanes	AES-1, AES-2, AES-3
McKinley Ave to West of Airport Way	Construct new 4 lane roadway	AES-1, AES-2, AES-3
From East of UPRR to SR-99	Widen from 2 to 4 lanes	AES-1, AES-2, AES-3
Main Street to SR-99	Construct new 4-lane expressway	AES-1, AES-2, AES-3
Yosemite Ave. to Lathrop Road	Widen from 2 to 4 lanes	AES-1, AES-2, AES-3
SR-120 to Woodward Ave	Construct new 2 lane expressway	AES-1, AES-2, AES-3
Woodward Ave to McKinley Ave	Construct new 4 lane roadway	AES-1, AES-2, AES-3
Woodward Ave to Main Street	Construct new 2 lane expressway	AES-1, AES-2, AES-3
SR 120 to Lathrop Road	Widen from 4 to 6 lanes	AES-1, AES-2, AES-3
City of Ripon		
Santos Road to South Clinton Avenue	Widen from 2 to 6 lanes	AES-1, AES-2, AES-3
Maple Avenue to 500 ft east of Acacia Avenue	Construct 2-lane extension of Garrison Road.	AES-1, AES-2, AES-3
Jack Tone Road to Olive Expressway	Widen from 2 to 6 lanes	AES-1, AES-2, AES-3
Jack Tone Road to Olive Expressway	Construct 4-lane extension of Canal Boulevard	AES-1, AES-2, AES-3
Canal Boulevard to Raymus Expressway	Construct 6-lane Olive Expressway	AES-1, AES-2, AES-3
San Joaquin County		
Tracy Blvd to Matthews Road	Passing lanes and channelization	AES-1, AES-2, AES-3
Tracy City Limits to 11th Street	Realign roadway and widen from 2 to 4 lanes with operational and safety improvements	AES-1, AES-2, AES-3
I-205 to Howard Road	Passing lanes and channelization	AES-1, AES-2, AES-3
Tracy City Limits to I-5	Operational and safety improvements along corridor and at intersections	AES-1, AES-2, AES-3
UPRR to Airport Way	Widen from 2 to 4 lanes with shoulders)	AES-1, AES-2, AES-3
Roth Road to French Camp Road	Widen from 2 to 4 lanes	AES-1, AES-2, AES-3
Escalon City limits to Mariposa Road	Widen from 2 to 4 lanes with shoulders	AES-1, AES-2, AES-3

Project Jurisdiction and Location	Improvement	Potential Impact
Austin Road to Jack Tone Road	Widen roadway from 2 to 3 lanes and widen BNSF railroad grade separation from 2 to 4 lanes	AES-1, AES-2, AES-3
City of Stockton		
Miner Avenue and Filbert Street Signal – City of Stockton	Install new traffic signal at the Miner Ave and Filbert St. intersection including EVP, ADA ramps, signs and striping	AES-1, AES-2, AES-3
Swain Road and Montauban Roundabout Installation – City of Stockton	Construct roundabout at Swain Road and Montauban Avenue including PTZ cameras, ADA ramp, signs, striping, and streetlights	AES-1, AES-2, AES-3
Tam O'Shanter Drive and Castle Oaks Drive Roundabout – City of Stockton	Install roundabout at intersection of Tam O'Shanter Drive and Castle Oaks Drive	AES-1, AES-2, AES-3
BRT Phase V – Stockton Metropolitan Area	Costs associated with installation of signal prioritization equipment for BRT Phase 5 operations on Weber Ave, Miner Ave, Wilson Way, Fremont Street, Filbert Street, and Main Street	AES-1, AES-2, AES-3
BRT Phase 1-B – Stockton Metropolitan Area	Costs associated with installation of signal prioritization equipment for BRT operations on Pacific Avenue and Madison Street. Replace signalized intersection at Miner Avenue and San Joaquin Street with a roundabout	AES-1, AES-2, AES-3
I-5 at Otto Drive	Construction of a new interchange and auxiliary lanes (PM 33.3/34.2)	AES-1, AES-2, AES-3
I-5 at Eight Mile Road	Modification of interchange (P.M. 34.7/35.9)	AES-1, AES-2, AES-3
SR-99 at Eight Mile Road	Reconstruct Interchange (PM 35.1-35.5)	AES-1, AES-2, AES-3
SR-99 at Morada	Reconstruct interchange (PM 23.5-24.5)	AES-1, AES-2, AES-3
I-5 at Hammer Lane	Interchange modification and auxiliary lanes (PM 32.6)	AES-1, AES-2, AES-3
West Ln to UPRR	Widen from 3 to 6 lanes	AES-1, AES-2, AES-3
UPRR (SPRR) to Wilson Way	Widen from 2 to 4 lanes with a middle turn lane. Construct curb, gutter, sidewalks and driveways.	AES-1, AES-2, AES-3
Fite Court to Frontier Way	Widen from 2 to 6 lanes	AES-1, AES-2, AES-3
Frontier Way to SR-99	Widen from 2 to 6 lanes	AES-1, AES-2, AES-3
March Ln to Hammer Ln	Construction of new 4 lane road	AES-1, AES-2, AES-3
Wilson Way to March Ln	Construction of new 4 lane road	AES-1, AES-2, AES-3
Armor Dr to Morada Ln	Widen from 4 to 6 lanes	AES-1, AES-2, AES-3
Marlette Rd to Pixley Slough	Widen from 2 to 6 lanes	AES-1, AES-2, AES-3
Morada Ln to Hammer Ln	Widen from 4 to 6 lanes	AES-1, AES-2, AES-3
Harding Way to Industrial Rd	Intersection and operational improvement	AES-1, AES-2, AES-3
New Road D to New Road F	Widen from 2 to 4 lanes	AES-1, AES-2, AES-3
New Road F to New Road E	Widen from 2 to 4 lanes	AES-1, AES-2, AES-3
I-5 to Thornton Rd	Widen from 5 to 6 lanes	AES-1, AES-2, AES-3
Thornton Road to Lower Sacramento Rd	Widen from 2 to 4 lanes	AES-1, AES-2, AES-3
Lower Sacramento Rd to West Lane	Widen from 2 to 6 lanes	AES-1, AES-2, AES-3
West Ln to Holman Rd	Widen from 2 to 6 lanes	AES-1, AES-2, AES-3

Project Jurisdiction and Location	Improvement	Potential Impact
Holman Rd to SR 99	Widen from 2 to 6 lanes	AES-1, AES-2, AES-3
Newcastle Rd to Fite Court	Widen from 2 to 6 lanes	AES-1, AES-2, AES-3
Wolfe Rd to Manthey Rd	Widen from 2 to 6 lanes	AES-1, AES-2, AES-3
Holman Rd to SR 99	Construction of new 8 lane road	AES-1, AES-2, AES-3
Stagecoach Road to Austin Road	Widen from 2 to 4 lanes	AES-1, AES-2, AES-3
Port of Stockton		
Rough & Ready Island Rail Bridge – City of Stockton	Construct new rail bridge (double-track) to replace existing deficient structure	AES-1, AES-2, AES-3
City of Tracy		
Corral Hollow Road and Valpico Road Traffic Signal – Corral Hollow Road and Valpico Road	Intersection signalization	AES-1, AES-2, AES-3
I-205/Lammers Road/Eleventh Street	Construct Interchange I-205 at Eleventh street realign and widen Eleventh Street to 6-lanes north of Grant Line to Byron Road. Construct Aux lane Hansen to Eleventh; in WB I-205 Eleventh Street to Grant Line Road	AES-1, AES-2, AES-3
I-205 at Mountain House Parkway	Reconstruct interchange	AES-1, AES-2, AES-3
I-580 at International Parkway/Patterson Pass Road	Reconstruct interchange	AES-1, AES-2, AES-3
I-205 at Grant Line Road	Modification of existing interchange	AES-1, AES-2, AES-3
I-205 at Chrisman Rd	Phase 1: Construct new interchange east-west ramps	AES-1, AES-2, AES-3
At MacArthur (PM 7.8 -PM 8.5)	Modification of existing interchange	AES-1, AES-2, AES-3
I-580 at Coral Hollow Road	Modification of existing interchange	AES-1, AES-2, AES-3
I-580 at Lammers Road	Modification of existing interchange	AES-1, AES-2, AES-3
I-580 at Iron Horse	Modification of existing interchange	AES-1, AES-2, AES-3
I-205 to I-580	Widen from 2 to 4 lanes, including reconstruction of Delta-Mendota Canal and California Aqueduct bridges	AES-1, AES-2, AES-3
Parkside Drive to Linne Road	Widen from 2 to 4 lanes	AES-1, AES-2, AES-3
Faith Lane (San Marco Subdivision limits) to Lammers Road	Extend 4 lane roadway	AES-1, AES-2, AES-3
Naglee Road to Lammers Road	Widen from 5 to 6 lanes	AES-1, AES-2, AES-3
Linne Road to I-580	Widen 2 to 4 lanes including ROW and construction of two bridges	AES-1, AES-2, AES-3
Mt. Diablo Road to Eleventh Street	Extend 4 lane roadway on new alignment and construct railroad grade separation	AES-1, AES-2, AES-3
I-205 to Eleventh Street	Widen from 4 lane minor arterial to 4 lane major arterial	AES-1, AES-2, AES-3

4.1.4 Cumulative Impacts

The cumulative impact analysis area for visual resources consists of the SJCOG region and adjoining counties. Information regarding these adjoining counties can be found in Section 3, *Environmental Setting*. Future development in this region that could impact visual resources is considered in the analysis. This cumulative extent is used to evaluate potential direct and indirect, permanent and

temporary impacts to scenic vistas, scenic resources, visual character, and light and glare within the context of the cumulative impact analysis area.

Some types of aesthetic resources are localized and would not be cumulative in nature. For example, the creation of light, glare, or shadows at one location would not be worsened by light, glare, or shadows created at another location. Rather, these effects are independent, and the determination as to whether they are adverse would be specific to the characteristics of the project and location of the site where they would occur.

Conversely, two types of aesthetic impacts may be additive in nature and thus cumulative: night sky lighting and overall changes in the visual environment as the result of increasing urbanization of large areas in the SJCOG region. Development in one area, such as a relatively large city adjoining agricultural land like Stockton, could increase and possibly expand over time and meet or connect with development in an adjoining ex-urban area. This type of growth and expansion would have the potential to affect night sky lighting experienced both within and outside of the region and lighting may increase in the form of larger and/or more intense nighttime glow in the viewshed. Regarding the visual environment experienced throughout the cumulative impact analysis areas, as planned cumulative development occurs over time the overall visual environment will change, and existing visual character could be degraded. The combination of forecasted development in the SJCOG region and planned development in neighboring counties will result in a different visual environment than currently exists. Thus, cumulative impacts to night sky lighting and changes in the visual environment are significant.

Although growth envisioned in the proposed 2022 RTP/SCS is primarily focused on infill areas, development outside of those geographies with long-distance views may result in nighttime lighting becoming more visible, covering a larger area and/or appearing in new areas because of projected development under the proposed 2022 RTP/SCS. Additionally, planned transportation improvements and the land use scenario envisioned in the proposed 2022 RTP/SCS would alter the existing visual environment from its baseline conditions. Mitigation measures described earlier in this section would reduce impacts to aesthetics; however, even with implementation of mitigation measures, impacts would be significant and would be cumulatively considerable.

4.2 Air Quality

This section evaluates the air quality impacts resulting from implementation of the proposed 2022 RTP/SCS. Both temporary impacts relating to construction activities and long-term impacts associated with population and employment growth and associated growth in vehicle traffic and energy consumption are discussed. In addition, the potential health risks associated with the proposed 2022 RTP/SCS land use scenario are discussed. Greenhouse gas emissions are analyzed in Section 4.9, G*reenhouse Gas Emissions and Climate Change.*

4.2.1 Setting

a. Climate and Meteorology

Air quality is affected by the rate and location of pollutant emissions and by climatic conditions that influence the movement and dispersion of pollutants. Atmospheric conditions, such as wind speed, wind direction and air temperature gradients, along with local and regional topography, mediate the relationship between air pollutant emissions and air quality.

The SJCOG region is located within the San Joaquin Valley Air Basin (SJVAB), which includes San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and western Kern County counties. The SJVAB is approximately 250 miles long and 35 miles in width (on average) and is bordered by the Coast Range Mountains on the west, the Sierra Nevada mountains on the east, and the Tehachapi Mountains to the south. On the valley floor, the SJVAB is open only to the north, which heavily influences prevailing winds. Northwesterly winds are common during summer months, and air masses are often channeled towards the southeastern end of the San Joaquin Valley. Winds are often weaker in the winter, which contribute to stagnation events in which transport of pollutants is very limited (San Joaquin Valley Air Pollution Control District [SJVAPCD] 2015).

The SJVAB is generally considered to have a Mediterranean climate, characterized by sparse rainfall and hot, dry summers. With an average of over 260 sunny days per year, the SJVAB provides favorable conditions for ozone formation. While precipitation and fog during the winter block sunlight and reduce ozone concentrations, wintertime fog provides favorable conditions for the formation of particulate matter (SJVAPCD 2015a).

Local climate conditions for the SJCOG region are shown in Table 4.2-1. As summarized therein, the warmest month of the year is July, and the coldest month of the year is January. The annual average maximum temperature is 75 degrees Fahrenheit (°F), while the annual average minimum temperature is 46°F.

Table 4.2-1 San Joaquin County Climate Conditions

Temperature Parameter or Metric	Condition
Average annual rainfall	15.4 inches
Average annual maximum temperature	75°F
Average annual minimum temperature	46°F
Warmest month	July
Coolest month	January
Average annual mean temperature	60°F
Average wind speed	7.7 miles per hour
Predominant wind direction	west/northwest

°F = degrees Fahrenheit

Note: Averages are based on the period of record from March 1906 to June 2016.

Source: Western Regional Climate Center 2016; Iowa Environmental Mesonet 2021.

b. Sources of Air Pollution

Air pollutant emissions in the SJVAB are generated primarily by stationary and mobile sources. Stationary sources can be divided into two major subcategories:

- Point sources occur at a specific location and are often identified by an exhaust vent or stack. Examples include boilers or combustion equipment that produce electricity or generate heat.
- Area sources are widely distributed and include such sources as residential and commercial water heaters, painting operations, lawn mowers, agricultural fields, landfills, and some consumer products.

Mobile sources refer to emissions from motor vehicles, including tailpipe and evaporative emissions, and can also be divided into two major subcategories:

- On-road sources may be legally operated on roadways and highways.
- Off-road sources include aircraft, ships, trains, and self-propelled construction equipment.

Air pollutants can also be generated by the natural environment, such as when high winds suspend fine dust particles.

c. Air Pollutants of Primary Concern

The federal and State Clean Air Acts mandate the control and reduction of certain air pollutants. Under these laws, the U.S. Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (CARB) have established the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) for "criteria pollutants" and other pollutants. Some pollutants are emitted directly from a source (e.g., vehicle tailpipe, an exhaust stack of a factory, etc.) into the atmosphere, including carbon monoxide, volatile organic compounds (VOC)/reactive organic gases (ROG),[1] nitrogen oxides (NO_X), particulate matter with diameters of up to ten microns (PM_{10}) and up to 2.5 microns ($PM_{2.5}$), sulfur dioxide, and lead. Other pollutants are

[1] CARB defines VOC and ROG similarly as, "any compound of carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate," with the exception that VOC are compounds that participate in atmospheric photochemical reactions. For the purposes of this analysis, ROG and VOC are considered comparable in terms of mass emissions, and the term ROG is used in this EIR.

created indirectly through chemical reactions in the atmosphere, such as ozone, which is created by atmospheric chemical and photochemical reactions primarily between ROG and NO_X. Secondary pollutants include oxidants, ozone, and sulfate and nitrate particulates (smog). The characteristics, sources and effects of criteria pollutants are discussed in the following subsections. The following subsections describe the characteristics, sources, and health and atmospheric effects of air pollutants of primary concern.

Ozone

Ozone is produced by a photochemical reaction triggered by sunlight between NO_X and ROG. ROG are composed of non-methane hydrocarbons (with some specific exclusions), and NO_X is composed of different chemical combinations of nitrogen and oxygen, mainly nitric oxide and nitrogen dioxide. NO_X are formed during the combustion of fuels, while ROG are formed during combustion and evaporation of organic solvents. As a highly reactive molecule, ozone readily combines with many different components of the atmosphere. Consequently, high levels of ozone tend to exist only while high ROG and NO_X levels are present to sustain the ozone formation process. Once the precursors have been depleted, ozone levels rapidly decline. Because these reactions occur on a regional rather than local scale, ozone is considered a regional pollutant. In addition, because ozone requires sunlight to form, it mostly occurs in concentrations considered serious between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans, including changes in breathing patterns, reduction of breathing capacity, increased susceptibility to infections, inflammation of lung tissue, and some immunological changes (U.S. EPA 2021a). Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

Carbon Monoxide

Carbon monoxide is a localized pollutant that is found in high concentrations only near its source. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is the incomplete combustion of petroleum fuels by automobile traffic. Therefore, elevated concentrations are usually only found near areas of high traffic volumes. Other sources of carbon monoxide include the incomplete combustion of petroleum fuels at power plants and fuel combustion from wood stoves and fireplaces during the winter. The health effects of carbon monoxide are related to its affinity for hemoglobin in the blood. Carbon monoxide causes a number of health problems, including aggravation of some heart diseases (e.g., angina), reduced tolerance for exercise, impaired mental function, and impaired fetal development. At high levels of exposure, carbon monoxide reduces the amount of oxygen in the blood, leading to mortality (U.S. EPA 2021a). Carbon monoxide tends to dissipate rapidly into the atmosphere; consequently, violations of the NAAQS and/or CAAQS for carbon monoxide are generally associated with localized carbon monoxide “hotspots” that can occur at major roadway intersections during heavy peak-hour traffic conditions.

Nitrogen Dioxide

Nitrogen dioxide is a by-product of fuel combustion; the primary sources are motor vehicles and industrial boilers and furnaces. The principal form of NO_X produced by combustion is nitric oxide, but nitric oxide reacts rapidly to form nitrogen dioxide, creating the mixture of nitric oxide and nitrogen dioxide commonly called NO_X. Nitrogen dioxide is an acute irritant that can aggravate respiratory illnesses and symptoms, particularly in sensitive groups (U.S. EPA 2021a). A relationship between nitrogen dioxide and chronic pulmonary fibrosis may exist, and an increase in bronchitis in

young children at concentrations below 0.3 parts per million (ppm) may occur. Nitrogen dioxide absorbs blue light, gives a reddish-brown cast to the atmosphere, and reduces visibility (U.S. EPA 2021a). It can also contribute to the formation of PM_{10} and acid rain.

Sulfur Dioxide

Sulfur dioxide is included in a group of highly reactive gases known as "oxides of sulfur." The largest sources of sulfur dioxide emissions are from fossil fuel combustion at power plants (73 percent) and other industrial facilities (20 percent). Smaller sources of sulfur dioxide emissions include industrial processes such as extracting metal from ore and the burning of fuels with a high sulfur content by locomotives, large ships, and off-road equipment. Sulfur dioxide is linked to a number of adverse effects on the respiratory system, including aggravation of respiratory diseases, such as asthma and emphysema, and reduced lung function (U.S. EPA 2021a).

Particulate Matter

Suspended atmospheric PM_{10} and $PM_{2.5}$ is comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes, and mists. Both PM_{10} and $PM_{2.5}$ are directly emitted into the atmosphere as by-products of fuel combustion and wind erosion of soil and unpaved roads. Particulate matter is also created in the atmosphere through chemical reactions. The characteristics, sources, and potential health effects associated with PM_{10} and $PM_{2.5}$ can be very different. PM_{10} is generally associated with dust mobilized by wind and vehicles while $PM_{2.5}$ is generally associated with combustion processes as well as formation in the atmosphere as a secondary pollutant through chemical reactions. $PM_{2.5}$ is more likely to penetrate deeply into the lungs and poses a health threat to all groups, but particularly to the elderly, children, and those with respiratory problems (CARB 2021a). More than half of $PM_{2.5}$ that is inhaled into the lungs remains there. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance (South Coast Air Quality Management District 2005). Suspended particulates can also reduce lung function, aggravate respiratory and cardiovascular diseases, increase mortality rates, and reduce lung function growth in children (U.S. EPA 2021a).

Lead

Lead is a metal found naturally in the environment, as well as in manufacturing products. The major sources of lead emissions historically have been mobile and industrial sources. However, because of the U.S. EPA's regulatory efforts to remove lead from gasoline, atmospheric lead concentrations have declined substantially over the past several decades. The most dramatic reductions in lead emissions occurred prior to 1990 due to the removal of lead from gasoline sold for most highway vehicles. Lead emissions were further reduced substantially between 1990 and 2008, with reductions occurring in the metals industries at least in part as a result of national emissions standards for hazardous air pollutants. As a result of phasing out leaded gasoline, metal processing currently is the primary source of lead emissions. The highest level of lead in the air is generally found near lead smelters. Other stationary sources include waste incinerators, utilities, and lead-acid battery manufacturers. The health impacts of lead include behavioral and hearing disabilities in children and nervous system impairment (U.S. EPA 2021a).

Toxic Air Contaminants

Toxic air contaminants (TACs) are a diverse group of air pollutants that may cause or contribute to an increase in deaths or serious illness, or that may pose a present or potential hazard to human health. TACs include both organic and inorganic chemical substances that may be emitted from a variety of common sources, including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. TACs are different than criteria pollutants because ambient air quality standards have not been established for TACs. TACs occurring at extremely low levels may still cause health effects and it is typically difficult to identify levels of exposure that do not produce adverse health effects. TAC impacts are described by carcinogenic risk and by chronic (i.e., long duration) and acute (i.e., severe but of short duration) adverse effects on human health.

TACs may result in long-term health effects such as cancer, birth defects, neurological damage, asthma, or genetic damage, or short-term acute effects such as eye watering, respiratory irritation, runny nose, throat pain, and headaches. TACs are considered either carcinogenic or non-carcinogenic based on the nature of the health effects associated with exposure. For carcinogenic TACs, potential health impacts are evaluated in terms of overall relative risk expressed as excess cancer cases per one million exposed individuals. Non-carcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur.

Diesel Particulate Matter

One of the main sources of TACs in California is diesel engine exhaust that contains solid material known as diesel particulate matter (DPM). Diesel exhaust is composed of two phases, either gas or particle, and both phases contribute to the risk. The gas phase is composed of many of the urban hazardous air pollutants, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde, and polycyclic aromatic hydrocarbons. Diesel exhaust has a distinct odor, which is primarily a result of hydrocarbons and aldehydes contained in diesel fuel. The particle phase also has many different types of particles that can be classified by size or composition. The size of diesel particulates that are of greatest health concern are those that are in the categories of fine and ultra-fine particles. The composition of these fine and ultra-fine particles may be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals, and other trace elements.

More than 90 percent of DPM is less than one micron in diameter (about $1/70^{th}$ the diameter of a human hair) and thus is a subset of $PM_{2.5}$. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lungs (CARB 2021a). The particles have hundreds of chemicals adsorbed onto their surfaces, including many known or suspected mutagens and carcinogens. The California Office of Environmental Health Hazard Assessment (OEHHA) completed a comprehensive health assessment of diesel exhaust in 1998, which formed the basis for CARB to formally identify the particles in diesel exhaust as a TAC. In California, DPM has a significant impact since it is estimated that 70 percent of total known cancer risk related to air toxics is attributable to DPM. According to CARB, DPM is estimated to increase statewide cancer risk by 520 cancers per million residents exposed over a lifetime (CARB 2021a).

DPM can also be responsible for elevated localized exposures (“hotspots”). Risk characterization scenarios conducted by CARB have determined the potential cancer risk resulting from proximity to DPM sources, such as school buses and high-volume freeways. California freeway studies show about a 70% drop off in particulate pollution levels at 500 feet from freeways and high-traffic roads

(CARB 2005). Residences and communities in proximity to TAC sources are disproportionately impacted. To protect people from TACs and reduce exposure, CARB recommends avoiding siting new sensitive land uses, such as residences, schools, daycare centers, playgrounds, or medical facilities, within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day. Additional non-cancer health risk attributable to proximity to freeways was seen within 1,000 feet and was strongest within 300 feet. California freeway studies show about a 70 percent drop-off in particulate pollution levels at 500 feet (CARB 2005).

Acute exposure to diesel exhaust may cause irritation to the eyes, nose, throat and lungs and some neurological effects such as lightheadedness. Acute exposure may also elicit a cough or nausea as well as exacerbate asthma. Chronic exposure in experimental animal inhalation studies has shown a range of dose-dependent lung inflammation and cellular changes in the lung and there are also diesel exhaust immunological effects. Based upon human and laboratory studies, there is considerable evidence that diesel exhaust is a likely carcinogen. Human epidemiological studies demonstrate an association between diesel exhaust exposure and increased lung cancer rates in occupational settings.

Besides DPM, several other pollutants are emitted by vehicle exhaust are a public health concern. U.S. EPA has identified five pollutants of highest priority in addition to DPM: acrolein, acetaldehyde, formaldehyde, benzene, and 1,3-butadiene. The latter five pollutants are found in organic gases emitted by vehicles.

Hydrocarbons and Other Organic Gases (Total Hydrocarbons, CH_4NMHC [non-methane], AHC, NHC)

Any of the vast family of compounds consisting of hydrogen and carbon in various combinations are known as hydrocarbons. Fossil fuels are included in this group. Many hydrocarbon compounds are major air pollutants, and those which can be classified as olefins or aromatics are highly photochemically reactive. Atmospheric hydrocarbon concentrations are generally higher in winter because the reactive hydrocarbons react more slowly in the winter and meteorological conditions are more favorable to their accumulating in the atmosphere to higher concentration before producing photochemical oxidants. Due to the role they play as ozone precursors, reactive hydrocarbons are one of the two criteria pollutants subject to federal ozone requirements.

Motor vehicles are a major source of anthropogenic hydrocarbons (AHC) in the basin. Other sources include evaporation of organic solvents and petroleum refining and marketing operations. Trees are the principal emitters of biogenic or natural hydrocarbons (NHC).

Certain hydrocarbons can damage plants by inhibiting growth and causing flowers and leaves to fall. Levels of hydrocarbons currently measured in urban areas are not known to cause adverse effects in humans. However, certain members of this contaminant group are important components in the reactions which produce photochemical oxidants (U.S. EPA 2021a).

d. Current Air Quality

California is divided geographically into 15 air basins for managing the air resources of the state on a regional basis. Areas within each air basin are considered to share the same air masses and, therefore, are expected to have similar ambient air quality. Depending on whether the federal and state standards are met or exceeded, the local air basin is classified as in “attainment” or “non-attainment.” Once a nonattainment area has achieved the air quality standards for a particular pollutant, it may be redesignated to an attainment area for that pollutant. SJVAPCD is required to

monitor air pollutant levels to assure the standards are met and, if they are not, to develop strategies to meet these standards.

Monitoring of ambient air pollutant concentrations is conducted by CARB, SJVAPCD, and the United States National Park Service. Some monitors are operated specifically for use in determining attainment status, while others are operated for other purposes, such as generating daily air quality forecasts. In total, SJVAPCD utilizes data from monitors operating at 29 sites in the SJVAB, three of which are in the SJCOG region. Figure 4.2-1 shows the locations of all monitoring stations in the SJVAB, including those in San Joaquin County that were in operation in 2021. The San Joaquin County portion of the SJVAB is classified as a nonattainment area for the federal 8-hour ozone and $PM_{2.5}$ standards and State ozone, PM_{10} and $PM_{2.5}$ standards. The SJVAB is classified as in attainment (or unclassifiable/attainment) for all other State and federal standards (SJVAPCD). Table 4.2-2 presents a ten-year summary of the days that the SJVAB exceeded NAAQS and CAAQS for ozone, $PM_{2.5}$, and PM_{10}. Table 4.2-3 presents the number of days San Joaquin County exceeded NAAQS and CAAQS for ozone, NO_2, $PM_{2.5}$, and PM_{10}.

Table 4.2-2 Ten-Year SJVAB Air Quality Summary (2010-2019) for Days Over the Ozone, $PM_{2.5}$, and PM_{10} NAAQS and CAAQS

Year	Ozone 1-Hour CAAQS	Ozone 8-Hour NAAQS	Ozone 8-Hour CAAQS	$PM_{2.5}$ 24 Hour NAAQS	PM_{10} 24 Hour NAAQS	PM_{10} 24 Hour CAAQS
2011	70	130	131	65	0	116
2012	72	131	134	39	0	89
2013	41	111	112	69	4	122
2014	48	122	128	53	8	139
2015	47	97	99	53	0	121
2016	51	112	113	34	0	158
2017	48	122	126	47	8	146
2018	42	111	112	61	10	164
2019	24	96	100	28	16	130
2020	50	119	121	80	39	157

CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less

Note: No aggregated summary data available for SJVAB through CARB Top-4 Summary tool post-2020

Source: CARB 2022

Table 4.2-3 Ambient Air Quality in San Joaquin County[1]

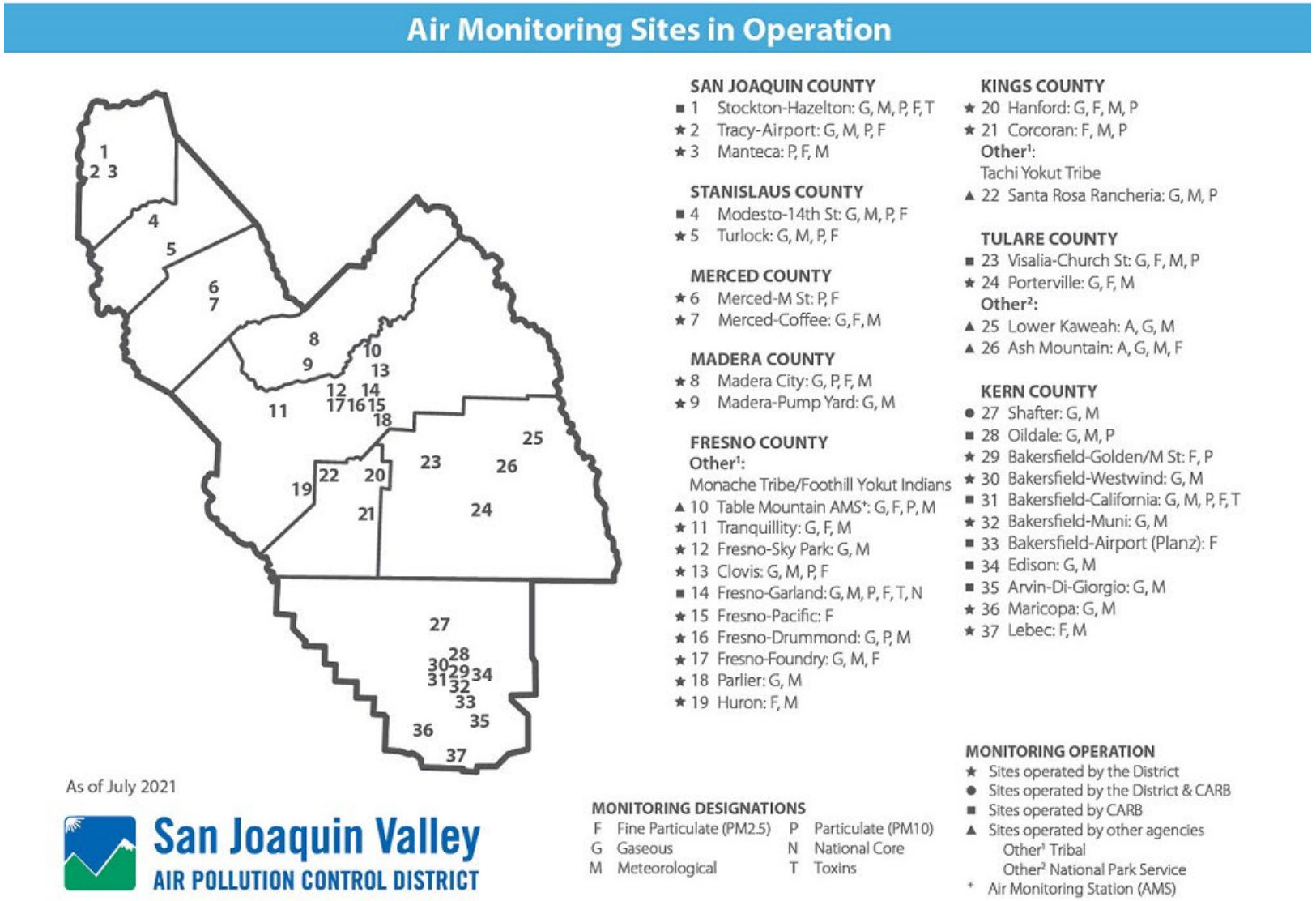
Pollutant	2018	2019	2020
Ozone (ppm), Eight-Hour Average	0.081	0.079	0.078
Number of days of state exceedances (>0.070 ppm)	8	4	4
Number of days of federal exceedances (>0.070 ppm)	8	4	4
Ozone (ppm), Worst Hour	0.099	0.098	0.100
Number of days of state exceedances (>0.09 ppm)	1	2	1
Nitrogen Dioxide (ppm), Worst Hour	0.0653	0.0723	0.0600
Number of days of state exceedances (>0.18 ppm)	0	0	0
Particulate Matter <10 microns (μg/m^3), Worst 24 Hours[1]	187.0	85.9	147.0
Number of days of state exceedances (>50 μg/m^3)	32	45	12
Number of days of federal exceedances (>150 μg/m^3)	13	0	0
Particulate Matter <2.5 microns (μg/m^3), Worst 24 Hours	188.0	50.1	140.0
Number of days of federal exceedances (>35 μg/m^3)	25	6	28

ppm = parts per million

1 Countywide data not available for this pollutant. Data obtained from the Stockton – Hazelton Street Station.

Source: CARB 2022

Figure 4.2-1 SJVAB Air Quality Monitoring Stations (2021)



Source: SJVAPCD 2021a

4.2.2 Regulatory Setting

a. Federal Laws, Regulations, and Policies

Clean Air Act

The federal Clean Air Act (CAA) governs air quality in the United States and is administered by the U.S. EPA at the federal level. Air quality in California is also governed by regulations under the California Clean Air Act, which is administered by CARB at the state level. At the regional and local levels, local air districts such as SJVAPCD typically administer the federal and California Clean Air Acts.

The U.S. EPA is responsible for enforcing the federal CAA, which defines non-attainment areas as geographic regions designated as not meeting one or more of the national ambient air quality standards (NAAQS) that are required under the 1977 CAA and subsequent amendments. The federal CAA requires that a State Implementation Plan (SIP) be prepared for each non-attainment area and a maintenance plan be prepared for each former non-attainment area that subsequently demonstrated compliance with the standards. A SIP is a compilation of a state's air quality control plans and rules, approved by the U.S. EPA. Section 176(c) of the CAA provides that federal agencies cannot engage, support, or provide financial assistance for licensing, permitting, or approving any project unless the project conforms to the applicable SIP. The state and the U.S. EPA's goals are to eliminate or reduce the severity and number of violations of the NAAQS and to achieve expeditious attainment of these standards.

Table 4.2-4 summarizes the NAAQS and California Ambient Air Quality Standards (CAAQS). The CAAQS are more restrictive than the NAAQS for several pollutants, including the one-hour standard for carbon monoxide, the 24-hour standard for sulfur dioxide, and the 24-hour standard for PM_{10}.

Table 4.2-4 Current Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standards	California Standards
Ozone	1-Hour	–	0.09 ppm
	8-Hour	0.070 ppm	0.070 ppm
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.030 ppm
	1-Hour	0.10 ppm	0.18 ppm
Sulfur Dioxide	Annual	–	–
	24-Hour	–	0.04 ppm
	1-Hour	0.075 ppm	0.25 ppm
PM_{10}	Annual	–	20 µg/m^3
	24-Hour	150 µg/m^3	50 µg/m^3
PM_{25}	Annual	12 µg/m^3	12 µg/m^3
	24-Hour	35 µg/m^3	–
Lead	30-Day Average	–	1.5 µg/m^3
	3-Month Average	0.15 µg/m^3	–

Pollutant	Averaging Time	Federal Primary Standards	California Standards
Visibility Reducing Particles	8-Hour	–	Extinction of 0.23 per kilometer*
Sulfates	24-Hour	–	25 µg/m^3
Hydrogen Sulfide	1-Hour	–	0.03 ppm (42 µg/m^3)
Vinyl Chloride	24-Hour	–	0.01 ppm 0.02 (26 µg/m^3)

ppm = parts per million; µg/m^3 = micrograms per cubic meter

* In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Source: CARB 2016

1990 Amendments to the Federal Clean Air Act

The 1990 amendments to the federal Clean Air Act included a provision to address air toxics. Under Title III of the federal Clean Air Act, the U.S. EPA establishes and enforces National Emission Standards for Hazardous Air Pollutants, which are national uniform standards oriented toward controlling particular hazardous air pollutants. Section 112(b) of the federal Clean Air Act identifies 189 "Air Toxics" (hazardous air pollutants), directs U.S. EPA to identify sources of the 189 pollutants, and establishes a 10-year time period for the U.S. EPA to issue technology-based emissions standards for each source category. Title III of the federal Clean Air Act provides for a second phase under which the U.S. EPA is to assess residual risk after the implementation of the first phase of standards and impose new standards, when appropriate, to protect public health.

Safer Affordable Fuel-Efficient Vehicles Rule

In August 2018, the U.S. EPA and NHTSA issued a proposed ruling to roll back some of the fuel economy and GHG standards for medium- and heavy-duty trucks. The new ruling proposed by the U.S. EPA and NHTSA, the Safer Affordable Fuel-Efficient (SAFE) Vehicle Rules, would replace the CAFE standards set for model year 2022-2025 passenger car and light trucks, while the 2021 model year vehicles will maintain the CAFE standards. The ruling is split into two parts.

Part One, "One National Program" (84 FR 51310), revokes a waiver granted by U.S. EPA to the State of California under Section 209 of the CAA to enforce more stringent emission standards for motor vehicles than those required by U.S. EPA for the explicit purpose of GHG reduction, and indirectly, criteria air pollutants and ozone precursor emission reduction. This revocation became effective on November 26, 2019, potentially restricting the ability of CARB to enforce more stringent GHG emission standards for new vehicles and set zero emission vehicle mandates in California.

Part Two addresses CAFE standards for passenger cars and light trucks for model years 2021 to 2026. This rulemaking proposes new CAFE standards for model years 2022 through 2026 and would amend existing CAFE standards for model year 2021. The proposal would retain the model year 2020 standards (specifically, the footprint target curves for passenger cars and light trucks) through model year 2026. The proposal addressing CAFE standards was jointly developed by NHTSA and U.S. EPA, with U.S. EPA simultaneously proposing tailpipe CO_2 standards for the same vehicles covered by the same model years.

In September 2019, U.S. EPA and the National Highway Traffic Safety Administration issued the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program, which revoked

California's authority to set its own GHG emissions standards and zero-emission vehicle mandates in California (84 Federal Register 51310). In April 2020, the federal agencies issued the SAFE Vehicles Rule Part Two for Model Years 2021–2026 Passenger Cars and Light Trucks, which relaxed federal GHG emissions and fuel economy standards (85 Federal Register 24174). On February 8, 2021, the incoming federal administration issued a stay in regard to the legal challenges by California and other states to the revocation of California's waiver (JDSupra 2021). On December 21, 2021, the National Highway Traffic Safety Administration (NHTSA) published its Corporate Average Fuel Economy (CAFE) Preemption rule, which finalizes its repeal of 2019's SAFE Rule Part One. On March 31, 2022, the NHTSA finalized new CAFE Standards for model years 2024 through 2026 that would increase federal CAFE standards compared to the SAFE Rule Part Two (NHTSA 2022).

b. State Laws, Regulations, and Policies

AB 32

Assembly Bill (AB) 32, also known as the Global Warming Solutions Act of 2006 (Nunez), expanded CARB's role to development and oversight of California's main GHG reduction programs. These include cap and trade, the Low Carbon Fuel Standard, and the zero-emission vehicle programs. With the passage of additional laws (such as Senate Bill [SB] 32 in 2016 and AB 398 in 2017), CARB continues to map out how these programs and others can help California reach its next statutory target: reducing GHG emissions an additional 40 percent below 1990 levels by 2030. Reductions in GHG emissions are tied to improvements in air quality.

California Clean Air Act

The California Clean Air Act (CCAA) was enacted in 1988 (California Health & Safety Code Section 39000 et seq.) and amended in 1992. The CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles (see Table 4.2-4). Air basins or areas that exceed the CAAQS are designated non-attainment until compliance is disclosed in an attainment plan. In California, CARB is responsible for meeting the State requirements of the federal CAA, administering the California CAA, and establishing the California ambient air quality standards (CAAQS). The California CAA, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain the CAAQS. CARB oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level.

Senate Bill 656 (Chapter 738, Statues of 2003)

In 2003, the California Legislature enacted Senate Bill (SB) 656 (Chapter 738, Statutes of 2003), codified as Health and Safety Code Section 39614, to reduce public exposure to PM_{10} and $PM_{2.5.}$ SB 656 required that, by January 1, 2005, CARB, in consultation with local air pollution control and air quality management districts (air districts), must develop and adopt a list of the most readily available, feasible, and cost-effective control measures that could be employed by CARB and the air districts to reduce PM_{10} and $PM_{2.5}$ (collectively referred to as PM). The legislation established a process for achieving near-term reductions in PM throughout California ahead of federally required deadlines for $PM_{2.5}$ and provided new direction on PM reductions in those areas not subject to federal requirements for PM. Measures adopted as part of SB 656 complement and support those required for federal $PM_{2.5}$ attainment plans, as well as for State ozone plans. This ensures continuing

focus on PM reduction and progress toward attaining California's more health protective standards. This list of air district control measures was adopted by CARB on November 18, 2004.

Toxic Air Contaminant Identification and Control Act of 1983

The Toxic Air Contaminant Identification and Control Act (Assembly Bill 1807) created California's program to reduce exposure to air toxics. The program involves a two-step process: risk identification and risk management. In the risk identification step, and upon CARB's request, the Office of Environmental Health Hazard Assessment evaluates the health effects of substances other than pesticides and their pesticidal uses. Substances with the potential to be emitted or that are currently being emitted into the ambient air may be identified as a TAC. In the risk management step, once a substance is identified as a TAC, and with the participation of local air districts, industry, and interested public, CARB prepares a report that outlines the need and degree to regulate the TAC through a control measure.

Assembly Bill 2588: Air Toxics "Hot Spots" Information and Assessment Act of 1987

The Air Toxics "Hot Spots" Information and Assessment Act (Assembly Bill 2588) was enacted in 1987 to require stationary sources to report the types and quantities of substances identified as having a localized health risk. This act aims to ascertain health risks, notify nearby residents of significant risks, and reduce significant risks to acceptable levels. The California Office of Environmental Health Hazard Assessment (OEHHA) is the lead agency for the assessment of health risks posed by environmental contaminants. OEHHA, which is an office within the California Environmental Protection Agency, aims to protect human health and the environment through scientific evaluation of risks posed by hazardous substances. In addition, OEHHA develops health-protective exposure levels for contaminants in air, water, and soil as guidance for regulatory agencies and the public. These include public health goals for contaminants in drinking water and both cancer potency factors and non-cancer reference exposure levels for the Air Toxics Hot Spots Program.

Executive Order N-79-20

In 2021, Governor Newsom signed Executive Order N-79-20 which calls for the elimination of new internal combustion passenger vehicles by 2035. The Executive Order establishes a target for the transportation sector that helps put the state on a path to carbon neutrality by 2045. Furthermore, the Executive Order provides momentum for providers of charging and refueling infrastructure, electric utilities, and others to plan for and support the increasing consumer demand for these vehicles (CARB 2021b).

CARB Air Quality and Land Use Handbook and 2017 Technical Advisory

CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* recommends that local agencies avoid siting new, sensitive land uses within specific distances of potential sources of TACs, such as freeways and high-traffic roads, distribution centers, railroads, and ports (CARB 2005). Specifically, CARB recommends that local agencies avoid siting new, sensitive land uses within 500 feet of a freeway. The primary concern is the effect of diesel exhaust particulate on sensitive uses.

CARB's *Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways* technical advisory (2017) identifies effective strategies that planners and other land use decision-makers can

implement locally and in the near-term to reduce exposure to near-roadway pollution from increased infill development while also protecting public health. These strategies complement the state's many efforts to reduce air pollution from all sources, including cars and trucks.

Diesel Risk Reduction Program

In August 1998, CARB identified particulate emissions from diesel-fueled engines (diesel PM) as TACs, based on data linking diesel PM emissions to increased risks of lung cancer and respiratory disease. Following the identification process, CARB was required to determine if there was a need for further control, which led to creation of the Diesel Advisory Committee to assist in the development of a risk management guidance document and risk reduction plan. In September 2000, CARB adopted the Diesel Risk Reduction Plan, which recommends control measures to reduce the risks associated with diesel PM and achieve a goal of 75 percent diesel PM reduction by 2010 and 85 percent by 2020. Specific statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles are continuing to be evaluated and developed. The goal of these regulations is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce diesel PM emissions.

Airborne Toxic Control Measures

Under the California Health and Safety Code, Division 26 (Air Resources), CARB is authorized to adopt regulations to protect public health and the environment through the reduction of TACs and other air pollutants with adverse health effects. CARB has promulgated several mobile and stationary source airborne toxic control measures (ATCMs) pursuant to this authority. For instance, effective as of July 2003, CARB approved an ATCM that limits school bus idling and idling at or near schools to only when necessary for safety or operational concerns (13 California Code of Regulations [CCR] Chapter 10, Section 2480). This ATCM is intended to reduce diesel PM and other TACs and air pollutants from heavy-duty motor vehicle exhaust. It applies to school buses, transit buses, school activity buses, youth buses, general public paratransit vehicles, and other commercial motor vehicles. This ATCM focuses on reducing public exposure to diesel PM and other TACs, particularly for children riding in and playing near school buses and other commercial motor vehicles who are disproportionately exposed to pollutants from these sources. In addition, effective February 2005, CARB approved an ATCM to limit the idling of diesel-fueled commercial motor vehicles with gross vehicular weight ratings of greater than 10,000 pounds, regardless of the state or country in which the vehicle is registered (13 CCR Chapter 10, Section 2485).

Drayage Truck Regulation

CARB established the Drayage Truck Regulation as part of its ongoing efforts to reduce PM and NO_X emissions from diesel-fueled engines and improve air quality associated with goods movement. The purpose of this regulation is to reduce emissions and public exposure to diesel PM, NO_X, and other air contaminants by setting emission standards for in-use, heavy-duty diesel-fueled vehicles.

Starting January 1, 2023, drayage trucks will be subject to the provisions of 13 CCR Section 2025, the Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants from In-Use Heavy Duty Diesel-Fueled Vehicles, which requires that all not otherwise exempt in-use on-road diesel vehicles, including drayage trucks, have a 2010 model year emissions equivalent engine by January 1, 2023 (13 CCR Section 2027).

Proposition 1B: Goods Movement Emission Reduction Program

The $1 billion Proposition 1B Goods Movement Emission Reduction Program is a partnership between CARB and local agencies, air districts, and seaports to quickly reduce air pollution emissions and health risk from freight movement along California's trade corridors. Local agencies apply to CARB for funding. Then those agencies offer financial incentives to owners of equipment used in freight movement to upgrade to cleaner technologies. Projects funded under this program must achieve early or extra emission reductions not otherwise required by law or regulation.

c. Regional Laws, Regulations, and Policies

San Joaquin Valley Air Pollution Control District

Air Quality Management Plans

The Federal Clean Air Act Amendments of 1990 set a schedule for the attainment of the NAAQS. States are required to prepare a State Implementation Plan (SIP) to develop strategies to bring about attainment of the standards. In addition, the California Clean Air Act of 1988 requires areas that exceed the California ambient air quality standards to plan for the eventual attainment of the CAAQS. SJVAPCD monitors and regulates local air quality in the SJVAB and implements Air Quality Management Plans (AQMPs). Since 1992, SJVAPCD has adopted numerous attainment plans to reduce ozone and particulate emissions.

The 2016 Ozone Plan is the most recent ozone attainment plan adopted by SJVAPCD. Implementation of each of the plans has contributed to the adoption of over 600 rules and amendments aimed at reducing air pollution concentrations. These measures have substantially reduced ozone precursor pollutants, which include NO_X and ROG. SJVAPCD is mandated under federal Clean Air Act requirements to develop a new attainment plan for the revised ozone standard by 2022, which is currently in progress. Ozone precursor emissions in the SJVAB are at historically low levels, with an approximately 80 percent reduction in NO_X stationary sources emissions since 1990 (SJVAPCD 2016).

The 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards is the most recent attainment plan for particulate matter adopted by SJVAPCD (SJVAPCD 2018b). On August 19, 2021, the District's Governing Board approved the *Attainment Plan Revision for the 1997 Annual $PM_{2.5}$ Standard* to establish a new attainment target for the 1997 annual $PM_{2.5}$ standard. The Valley would have met this standard by the projected attainment target of 2020, but for the significant wildfire impacts and data collection issues at the air monitoring site in Bakersfield (operated by CARB). Based on implementation of the control strategy in the 2018 $PM_{2.5}$ Plan, it is estimated that the SJVAB will attain the 1997 annual $PM_{2.5}$ standard by 2023 (SJVAPCD 2021b).

Rules and Regulations

SJVAPCD has adopted numerous rules and regulations directed at improving regional air quality. The following District rules would be applicable to individual projects:

- **Rule 4102 Nuisance:** A person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property.

- **Rule 8021 Earthmoving Activities:** Requires construction, demolition, excavation, extraction, and other earthmoving activities to include implementation of measures designed to limit fugitive dust emissions.
- **Rule 8041 Carryout and Trackout:** Requires owners and operators to sufficiently prevent or cleanup carryout and trackout as described in SJVAPCD Regulation VIII. The use of blower devices, or dry rotary brushes or brooms, for removal of carryout and trackout on public roads is expressly prohibited. The removal of carryout and trackout from paved public roads does not exempt an owner/operator from obtaining state or local agency permits which may be required for the cleanup of mud and dirt on paved public roads.
- **Rule 8061 Paved and Unpaved Roads:** Requires implementation of control measures and design criteria to limit fugitive dust emissions from any new or existing public or private paved or unpaved road, road construction project, or road modification project.
- **Rule 9510 Indirect Source Review (ISR):** Requires new developments expected to create a substantial amount of air pollution to incorporate on-site mitigation or emission reducing designs and practices into the project.

d. Local Laws, Regulations, and Policies

City and county general plans within the SJCOG region contain policies to protect air quality. Listed below are the policies from the County of San Joaquin and cities in the SJCOG region applicable to air quality. Cities in the region have generally similar policies, and examples are provided in more detail below.

County of San Joaquin

The County of Joaquin has established a series of provisions in the San Joaquin County 2035 General Plan that relate to the physical development of the County. Several goals and policies contained in the General Plan relate to air quality (County of San Joaquin 2012). Applicable goals related to air quality are as follows:

- **LU-1.1 Compact Growth and Development:** The County shall discourage urban sprawl and promote compact development patterns, mixed-use development, and higher-development intensities that conserve agricultural land resources, protect habitat, support transit, reduce vehicle trips, improve air quality, make efficient use of existing infrastructure, encourage healthful, active living, conserve energy and water, and diversify San Joaquin County's housing stock.
- **TM-4.1 Pedestrian and Bicycle Network Continuity:** The County shall strive to eliminate gaps in the rural bicycle network by constructing or designating new bike facilities, where appropriate, and in accordance with the San Joaquin Bicycle Master Plan.
- **TM-5.3 Variety of Transit Types:** The County shall consider a variety of transit types including regional rail, bus rapid transit, regional and local buses, express buses, and neighborhood shuttles, to meet the needs of residents, workers, and visitors.
- **TM-5.4 Alternative to the Automobile**: The County shall promote public and private transit systems in addition to the automobile.
- **C-1.6 Promote Infill:** The County shall promote infill development within existing urban and rural communities and City fringe areas before expanding community boundaries.

- **PHS-5.2 SJVAPCD Coordination:** The County shall coordinate with the SJVAPCD during the review of new development projects which have the potential for causing adverse air quality impacts.
- **PHS-5.4 Innovative Mitigation Measures:** The County shall encourage innovative mitigation measures and project redesign to reduce air quality impacts by coordinating with the SJVAPCD, project applicants, and other interested parties.
- **PHS-5.6 Toxic Air Contaminants:** The County shall require effective buffers between residential areas and other sensitive receptors and non-residential land uses, such as highways, trucking centers, gasoline dispensing facilities, and dry cleaners, that generate toxic air contaminants.
- **PHS-5.7 ATAC Exposure Reduction Measures for New Development:** The County shall require new development projects to implement all applicable best management practices that will reduce exposure of sensitive receptors (e.g., hospitals, schools, daycare facilities, elderly housing and convalescent facilities) to toxic air contaminants.
- **PHS-5.8 Minimize Motor Vehicle Emissions:** The County shall strive to minimize motor vehicle emissions through land use and transportation strategies, as well as by promotion of alternative fuels.
- **PHS-5.9 Particulate Emissions from Construction:** The County shall support SJVAPCD efforts to reduce PM_{10} and $PM_{2.5}$ emissions from construction, grading, excavation, and demolition to the maximum extent feasible and consistent with State and Federal regulations.
- **PHS-5.10 Particulate Emissions from County Roads:** The County shall require PM_{10} and $PM_{2.5}$ emission reductions on County-maintained roads to the maximum extent feasible and consistent with State and Federal regulations.

City of Stockton

The Stockton 2040 General Plan (2014) also contains the following actions:

- **Action LU-1.1A:** Require renovated and new mixed-use projects to be planned and designed to contribute to the corridor's identity through appropriate public spaces, gateways, streetscapes, pedestrian walkways, setbacks, edge treatments, and other design features.
- **Action LU-2.5A:** Improve transit, bicycle, and pedestrian connectivity between the Downtown and local colleges and universities.
- **Action TR-1.1A:** Direct truck traffic to designated truck routes that facilitate efficient goods movement and minimize risk to areas with concentrations of sensitive receptors, such as schools, for example by disallowing any new truck routes to pass directly on streets where schools are located, and vulnerable road users, like pedestrians and bicyclists.
- **Action TR-2.2D:** Support efforts to electrify buses.
- **Action SAF-4.1A:** Require the construction and operation of new development to implement best practices that reduce air pollutant emissions, including:
  - Use of low-emission and well-maintained construction equipment, with idling time limits.
  - Development and implementation of a dust control plan during construction.
  - Installation of electrical service connections at loading docks, where appropriate.
  - Installation of Energy Star-certified appliances.
  - Entering into Voluntary Emissions Reduction Agreements with the SJVAPCD.

- **Action SAF-4.1C:** Require the use of electric-powered construction and landscaping equipment as conditions of project approval when appropriate.
- **Action SAF-4.1D:** Limit heavy-duty off-road equipment idling time to meet CARB's idling regulations for on-road trucks.
- **Action SAF-4.2A:** Provide information and conduct marketing and outreach to major existing and new employers about the transportation demand management (TDM) program facilitated by SJCOG.
- **Action SAF-4.3B:** Coordinate review of development project applications with the SJVAPCD to ensure that air quality impacts are consistently identified and mitigated during CEQA review.

City of Tracy

The City of Tracy includes policies relating to air quality in the Air Quality Element of its General Plan (2011). Some of the policies include:

- **Policy AQ-1.1-P1**: The City shall promote land use patterns that reduce the number and length of motor vehicle trips.
- **Policy AQ-1.1-P2**: To the extent feasible, the City shall maintain a balance and match between jobs and housing.
- **Policy AQ-1.1-P3:** Higher density residential and mixed-use development shall be encouraged adjacent to commercial centers and transit corridors
- **Policy AQ-1.1-P4:** Employment areas should include a mix of support services to minimize the number of trips.
- **Policy AQ-1.1-P5:** Village Centers and other retail and office areas should be located within walking and biking distance of existing and proposed residential developments.
- **Policy AQ-1.2-P2**: The City shall assess air quality impacts using the latest version of the CEQA Guidelines and guidelines prepared by the SJVAPCD.
- **Policy AQ-1.2-P3**: Developers shall implement best management practices to reduce air pollutant emissions associated with the construction and operation of development projects.

Other cities within the SJCOG region include Escalon, Lathrop, Lodi, Manteca, and Ripon. The General Plans of these cities include goals and policies pertaining to air quality that are similar to those outlined above.

4.2.3 Impact Analysis

a. Methodology and Significance Thresholds

This analysis uses the guidance and methodologies recommended in the SJVAPCD's 2015 *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI) (SJVAPCD 2015a) to determine whether the proposed 2022 RTP/SCS impacts exceed the thresholds identified in CEQA Guidelines Appendix G.

Significance Thresholds

Based on Appendix G of the CEQA Guidelines, the 2022 RTP/SCS would have a significant impact on air quality if it would:

1 Conflict with or obstruct the implementation of the applicable air quality plan

2 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard

3 Expose sensitive receptors to substantial pollutant concentrations

4 Result in other emissions (such as those leading to odors adversely affecting a substantial number of people)

The GAMAQI does not provide guidance applicable to a program of projects. However, the SJVAPCD's GAMAQI includes significance criteria for evaluating construction and operational emissions associated with individual projects. SJVAPCD recommends the use of quantitative thresholds to determine if a project would significantly contribute to a nonattainment designation based on the emissions generated. These thresholds are shown in Table 4.2-5. SJVAPCD Rule 9510, Indirect Source Review, and Regulation VIII, Fugitive PM_{10} Prohibitions, would apply to individual projects under the 2022 RTP/SCS as appropriate.

Table 4.2-5 SJVAPCD Air Quality Significance Thresholds

Pollutant	NO_X	ROG	PM_{10}	$PM_{2.5}$	SO_X	CO
Construction and Operation Thresholds (Tons Per Year)	10	10	15	15	27	100

NO_X = nitrogen oxides; ROG = reactive organic gases; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{1.5}$ = particulate Matter with a diameter of 2.5 microns or less

Source: SJVAPCD 2015a

In addition to the annual thresholds outlined above, SJVAPCD has published the *Ambient Air Quality Analysis Project Daily Emissions Assessment* guidance, which is summarized in Section 8.4.2, *Ambient Air Quality Screening Tools*, of the SJVAPCD's GAMAQI (2015). The *Ambient Air Quality Screening Tools* guidance provides a screening threshold of 100 pounds per day for NO_X, ROG, PM_{10}, $PM_{2.5}$, SO_X, and CO. SJVAPCD recommends that an ambient air quality analysis be performed for all criteria pollutants when emissions of any criteria pollutant resulting from project operational activities exceed the 100 pounds-per-day screening level, after compliance with Rule 9510 requirements and implementation of all enforceable mitigation measures.

Short-Term Emissions Methodology

Emissions from construction activities represent temporary impacts that are typically short in duration, depending on the size, phasing, and type of project. Air quality impacts can nevertheless be acute during construction periods, resulting in significant localized impacts to air quality. Construction-related emissions are speculative at the RTP/SCS level because such emissions are dependent on the characteristics of individual development projects. However, because construction of projects under the proposed 2022 RTP/SCS would generate temporary criteria pollutant emissions, primarily due to the operation of construction equipment and truck trips, a qualitative analysis is provided.

Long-Term Emissions Methodology

The methodology for determining the significance of air quality impacts compares baseline conditions in 2016 to future 2046 conditions, as required in CEQA Guidelines Section 15126.2(a). For the purposes of this analysis, a 2016 baseline is used to match the SJCOG transportation modeling baseline. This allows an accurate, *apples to apples* comparison to the same baseline year. This baseline is consistent with the baseline used in SJCOG's Sustainable Communities Strategy, and as

such is more reflective of the comparative analysis made within the SCS than if data from a different year was used. Pursuant to Section 15125(a)(1) of the *State CEQA Guidelines,* although the analysis baseline will normally reflect physical environmental conditions as they exist at the time the notice of preparation is published, "where necessary to provide the most accurate picture practically possible of the project's impacts, a lead agency may define existing conditions by referencing historic conditions." SJCOG has elected to do so here, for the reasons just described.

State and federal clean air laws require that emissions of pollutants for which NAAQS or CAAQS are violated be reduced from current levels. Therefore, for Impact AQ-3, the project's long-term mobile source impacts to air quality would be considered significant if the proposed 2022 RTP/SCS would result in mobile source emissions that exceed existing levels. In this case, the pollutants of concern are ozone precursors (NO_x and ROG), PM_{10}, and $PM_{2.5}$ because these are the primary pollutants associated with vehicle transportation.

Projected air emissions from mobile sources were calculated using the EMFAC2021 model with data for vehicle miles traveled (VMT) from the RTP/SCS transportation analysis completed by SJCOG. Data from EMFAC outputs and SJCOG's transportation analysis were used to calculate projected vehicle emissions. Induced demand VMT is included in the total VMT used for modeling. Induced demand is demand that has been realized by improvements made to transportation infrastructure. For example, a road-widening project may generate increased traffic because the roadway is perceived by drivers to be a more viable travel route. Projected vehicle emissions for the year 2046 under the proposed 2022 RTP/SCS were compared to baseline 2016 conditions.

Health Impacts

Short-term and long-term exposure to criteria pollutants and TACs may result in adverse health effects, based on the information presented in Section 4.2.1(c), *Air Pollutants of Primary Concern*. As discussed in that section, these effects may include: aggravated asthma, increases in respiratory symptoms like coughing and difficult or painful breathing, chronic bronchitis, decreased lung function, increased cancer risk, heart attack, and premature death.

The NAAQS and CAAQS are health-based standards. Therefore, in this impact analysis, if the proposed 2022 RTP/SCS would result in cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State ambient air quality standard, it would also contribute to these adverse health effects.

The SJVAPCD has determined thresholds of significance for TAC emissions from the operation of both permitted and non-permitted sources. The significance threshold for long-term public health risk is set at 20 excess cancer cases in a million for cancer risk. For non-cancer risk (i.e., chronic or acute risk), the significance threshold is set at a hazard index of greater than 1.0. The health impacts of TACs are discussed separately under Impact AQ-4.

b. Project Impacts and Mitigation Measures

This section discusses impacts and mitigation measures associated with transportation projects and the land use scenario contained within the 2022 RTP/SCS. Specific projects may generate air quality impacts during construction and operation. Section 4.2.3(c) summarizes the impacts associated with transportation projects in the 2022 RTP/SCS. Due to the programmatic nature of the 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed

transportation improvement projects and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following sections.

Threshold 1:	Conflict with or obstruct implementation of the applicable air quality plan.

Impact AQ-1 THE PROPOSED 2022 RTP/SCS WOULD NOT CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE APPLICABLE AIR QUALITY PLAN. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The policies and land use patterns facilitated by the proposed 2022 RTP/SCS are projected to reduce emissions of ozone precursors and particulate matter below 2016 baseline levels, as discussed under Impact AQ-3 (see Table 4.2-8), which is consistent with the goals and policies of SJVAPCD's 2016 Ozone Plan and 2018 $PM_{2.5}$ Plan. Although VMT would increase as compared to baseline levels, emissions would decrease due to increasingly fuel-efficient vehicles, improving emissions control technology, and an increased share of electric vehicle adoption. In addition, implementation of proposed transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS, among other strategies, would improve alternative transportation options and circulation. To accommodate future growth in the region while reducing emissions, the strategy of the proposed 2022 RTP/SCS is to develop an efficient circulation network with multi-modal transportation in addition to promoting congestion management; coordinating land use, housing, and transportation systems; and providing incentives that reduce vehicle use. Implementation of these strategies would result in reduced overall vehicle miles traveled, which would reduce regional criteria air pollutant emissions and TAC emissions from mobile sources. The goals of the 2016 Ozone Plan and the 2018 $PM_{2.5}$ Plan are to reduce precursor pollutants, which include NO_X and ROG, and particulate matter pollutants within the SJVAB. The above RTP/SCS strategies and other actions in the proposed 2022 RTP/SCS would align with the emissions reduction goals of both SJVAPCD attainment plans. Therefore, implementation of the proposed 2022 RTP/SCS would not conflict with or obstruct implementation of the applicable air quality plans, and this impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

Threshold 2:	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 (construction)

Impact AQ-2 CONSTRUCTION ACTIVITIES ASSOCIATED WITH TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE IN CRITERIA POLLUTANTS FOR WHICH THE PROJECT REGION IS NON-ATTAINMENT UNDER AN APPLICABLE FEDERAL OR STATE AMBIENT AIR QUALITY STANDARD. THIS IMPACT WOULD BE SIGNIFICANT AND UNAVOIDABLE.

There are three primary sources of short-term emissions that would be generated by construction of future transportation projects under the proposed 2022 RTP/SCS. These sources include:

- Operation of construction vehicles (i.e., scrapers, loaders, dump trucks);
- The creation of fugitive dust during clearing and grading; and
- The use of asphalt or other oil- based substances during the final construction phases, which also generate nuisance odors.

The significance of daily emissions, particularly ROG and NO_X emissions, generated by construction equipment utilized to build RTP/SCS transportation improvements would depend on the quantity of equipment used and the hours of operation. The significance of fugitive dust ($PM_{2.5}$ and PM_{10}) emissions would depend upon the following factors:

- The areal extent of disturbed soils;
- The length of disturbance time;
- Whether existing structures are demolished;
- Whether excavation is involved (including the potential removal of underground storage tanks); and
- Whether transport of excavated materials offsite is necessary.

Intersection improvements, such as signalization or signal coordination, are small-scale projects and are not expected to generate significant short-term emissions. However, other RTP/SCS projects as well as future development facilitated by the SCS land use scenario may involve grading and paving, or the construction of permanent facilities. For example, substantial grading and paving would be required for roadway widening and other large improvements on State Routes and regional roadways. The precise quantity of emissions would need to be determined at the time of proposed construction of a given transportation improvement or development project. When project-specific CEQA documents are prepared, these emissions would be compared to SJVAPCD's construction thresholds, as listed in Section 4.2.3(a), *Methodology and Significance Thresholds* under Threshold 2(a). Although any individual transportation improvement or development project may not generate significant short-term emissions, it is probable that several projects would be under construction simultaneously, generating cumulative construction emissions that could impact air quality. SJVAPCD construction emissions thresholds listed in Section 4.2.3(a), *Methodology and Significance Thresholds* under Threshold 2(a) would be used to determine whether construction impacts of individual projects are significant. In addition, construction equipment would be subject to the stringent rules and regulations adopted by the U.S. EPA and CARB to reduce criteria pollutant and hazardous emissions limits from on-road vehicles and off-road equipment. For example, CARB has the In-Use Off-Road Diesel-Fueled Fleets Regulation to reduce particulate matter and NOx from off-road heavy-duty diesel vehicles from various industries including air travel, manufacturing, and landscaping. In addition, the U.S. EPA and CARB both have ignition diesel engine standards for non-road portable equipment, such as diesel generators and air compressors, which require the non-road equipment engines to be rated a cleaner tier by specific years, which will result in reduced emissions (CARB 2021c, U.S. EPA 2016).

Even though these regulations exist, it cannot be assumed that projects under the proposed 2022 RTP/SCS would be constructed using the latest and lowest emitting construction equipment for a majority of their construction fleet. Therefore, short-term impacts would be significant because construction emissions could exceed SJVAPCD significance thresholds and result in cumulatively considerable net increases in $PM_{2.5}$ and PM_{10} and/or ozone precursor emissions. Implementation of mitigation measures for individual projects would reduce PM and ozone precursor emissions. However, this impact would remain significant and unavoidable. The following mitigation measures would reduce this impact.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures developed

for the proposed 2022 RTP/SCS program where applicable for transportation projects that would result in fugitive dust and ozone precursor emissions. Cities and the County can and should implement these measures, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions.

AQ-2(a) Application of SJVAPCD Feasible Mitigation Measures

For all projects, the implementing agency shall incorporate the most recent SJVAPCD feasible construction mitigation measures and/or technologies for reducing inhalable particles based on analysis of individual sites and project circumstances. Additional and/or modified measures may be adopted by SJVAPCD prior to implementation of individual projects under the proposed 2022 RTP/SCS; therefore, the most current list of feasible mitigation measures at the time of project implementation shall be used. The current SJVAPCD feasible mitigation measures include the following (SJVAPCD 2015b):

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, tarp cover, or other suitable cover or vegetative ground cover.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
- An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles shall implement measures to prevent carryout and trackout.
- Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use.

AQ-2(b) Diesel Equipment Emissions Standards

The implementing agency shall ensure, to the maximum extent feasible, that diesel construction equipment meeting CARB Tier 4 emission standards for off-road heavy-duty diesel engines is used. If use of Tier 4 equipment is not feasible, diesel construction equipment meeting Tier 3 (or if infeasible, Tier 2) emission standards shall be used. These measures shall be noted on all construction plans, and the implementing agency shall perform periodic site inspections.

AQ-2(c) Electric Construction Equipment

The implementing agency shall ensure that to the extent feasible, construction equipment utilizes electricity from power poles rather than temporary diesel power generators and/or gasoline power generators.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. These mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate.

Significance After Mitigation

Implementation of Measures AQ-2(a) through AQ-2(c) would reduce short-term construction emissions from individual projects and thus reduce the severity of impacts by requiring best practices for dust and exhaust emissions via readily available, lower-emitting diesel equipment, and/or equipment powered by alternative cleaner fuels (e.g., propane) or electricity, as well as on-road trucks using particulate exhaust filters. To the extent that an implementing agency requires an individual project to implement all feasible mitigation measures described above, individual project impacts may be reduced to a less than significant level. Implementation of Mitigation Measure GHG-1 would also reduce construction emissions from the proposed 2022 RTP/SCS. However, these mitigation measures may not be feasible or effective for all projects. Therefore, this impact would remain significant and unavoidable. No additional mitigation measures to reduce this impact to less than significant levels are feasible at the programmatic level.

Threshold 2:	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 (operation)

Impact AQ-3 OPERATION OF THE PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE OF A CRITERIA POLLUTANT FOR WHICH THE PROJECT REGION IS NON-ATTAINMENT UNDER AN APPLICABLE FEDERAL OR STATE AMBIENT AIR QUALITY STANDARD. IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.

Transportation Emissions

Projected on-road vehicle emissions on the SJCOG transportation network for the year 2046 under proposed 2022 RTP/SCS conditions were compared to baseline (2016) conditions.

Table 4.2-6 shows the results of the long-term emissions analysis based on Total Daily VMT for the SJCOG region.

Table 4.2-6 Regional Air Pollutant Emissions – SJCOG Region

Scenario	VMT	ROG (tons/day)	NO_X (tons/day)	$PM_{2.5}$ (tons/day)[1]	PM_{10} (tons/day)[1]
2016 Baseline	17,015,116	5.847	17.264	0.458	0.824
2046 with Proposed 2022 RTP/SCS	23,495,442	2.069	4.772	0.279	0.761
Net Change from 2016 Baseline	**8,369,997**	**(3.778)**	**(12.493)**	**(0.178)**	**(0.062)**

( ) denotes a negative number

[1] $PM_{2.5}$ and PM_{10} includes tire wear and brake wear emissions

Notes: The on-road mobile source criteria pollutant emissions estimates for the proposed 2022 RTP/SCS were calculated using CARB's EMFAC2021 emission inventory model. VMT data was provided by SJCOG. Emission totals may not add up due to rounding.

Source: See Appendix A for EMFAC2021 modeling results

As shown in Table 4.2-6, emissions of ROG, NO_X, $PM_{2.5}$ and PM_{10} under the proposed 2022 RTP/SCS would decrease as compared to SJCOG's 2016 baseline despite a projected increase in VMT. This decrease in emissions is consistent with the statewide downward trend for these pollutants as a result of CARB rules designed to reduce emissions from cars and trucks. The transportation improvements and future land use scenario envisioned by the RTP/SCS encourage improved circulation and higher density development along transportation corridors, which would further reduce on-road mobile emissions. The proposed 2022 RTP/SCS is intended to increase residential and commercial land use capacity within existing transit corridors, shifting a greater share of future growth to these corridors and ultimately increasing density, improving circulation and multi-modal connections, designed to lower per capita VMT, which would have a beneficial effect on air quality.

As previously noted, San Joaquin County is currently in nonattainment for federal and state $PM_{2.5}$ and ozone standards and state PM_{10} standards. As shown in

Table 4.2-6, emissions levels for ozone precursors are forecast to decline despite projected future growth. NO_X emissions are primarily generated by trucks and are expected to decrease over time due in part to the impact of CARB rules designed to reduce NO_X emissions from diesel trucks and buses. ROG emissions are primarily due to gasoline vehicles and are lower due to improvements in vehicle emission rates. Decreasing PM_{10} and $PM_{2.5}$ emissions are also generally consistent with statewide trends.

In addition to specific transportation improvements and land use scenarios, the proposed 2022 RTP/SCS also includes several policies that would contribute to a reduction of air pollutants. Below is a summary of the proposed 2022 RTP/SCS goals and policies that promote improvements to air quality:

- **Strategy No. 3:** Enhance the connection between land use and transportation choices through projects supporting energy and water efficiency.
- **Strategy No. 4:** Improve air quality by reducing transportation-related emissions.
- **Strategy No. 6:** Encourage infill development and development near transit, including transit-oriented development to maximize existing transit investments.
- **Strategy No. 7:** Provide transportation improvements to facilitate nonmotorized travel, including incorporation of complete streets elements as appropriate.
- **Strategy No. 12:** Prioritize projects that make more efficient use of the existing road network.

- **Strategy No. 16:** Promote electric power, alternative fuels, and autonomous technologies for public transit
- **Strategy No. 30:** Enhance public health through active transportation projects.

The air pollutant emissions shown in Table 4.2-6 are modeled emissions based on estimated VMT. The results do not account for some proposed VMT reduction strategies, such as a transportation demand management plan, telecommuting, and transit service enhancements, because these strategies are off-model reductions that cannot be included in EMFAC. The mobile air pollutant emissions from the proposed 2022 RTP/SCS are expected to further decrease with the inclusion of these VMT reduction strategies, such that the analysis herein represents a reasonable worst-case scenario for air pollutant emissions. Therefore, long-term operational air quality impacts associated with mobile source emissions would be less than significant.

Other Land Use Emissions

In addition to the transportation-related GHG emissions shown in Table 4.2-6, land use projects envisioned by the land use scenario in the proposed 2022 RTP/SCS would also result in criteria air pollutant emissions due to sources such as architectural coatings, consumer products, fireplaces, landscaping equipment, and natural gas usage. Over the planning period, per capita emissions associated with consumer products, architectural coatings, fireplaces, landscaping equipment, and natural gas consumption are anticipated to decline, primarily as a result of increasingly stringent CARB and SJVAPCD rules and regulations. In addition, the proposed 2022 RTP/SCS would reduce per capita transportation related air pollutant emissions associated with future land use development, which would contribute to an overall reduction in per capita air pollutant emissions associated with future (2046) land use development as compared to 2016 baseline conditions. Nevertheless, the proposed land use scenario would most likely increase countywide ROG, PM_{10}, and $PM_{2.5}$ emissions based on growth forecasts, which would increase the likelihood that San Joaquin County will continue to exceed the federal and state $PM_{2.5}$ and ozone standards and state PM_{10} standards for which San Joaquin County is currently in non-attainment. Also, individual land use projects could exceed the SJVAPCD operational significance thresholds as listed in Section 4.2.3(a), *Methodology and Significance Thresholds* under Threshold 2(b). Therefore, because operational emissions generated by the proposed 2022 RTP/SCS land use scenario would contribute to existing non-attainment conditions in the SJVAB, impacts would be significant. The following mitigation measure would reduce this impact.

Mitigation Measures

For land use projects under their jurisdiction, cities and the County can and should implement the following mitigation measure, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project-specific environmental documents may adjust this mitigation measure as necessary to respond to site-specific conditions.

AQ-3 Long-term Regional Operational Emissions

Implementing agencies can and should implement long-term operational emissions reduction measures. Such reduction measures include the following:

- Require that all interior and exterior architectural coatings for all developments utilize coatings following SJVAPCD Rule 4601, *Architectural Coatings*.

- Increase building envelope energy efficiency standards in excess of applicable building standards and encourage new development to achieve zero net energy use.
- Install energy-efficient appliances, interior lighting, and building mechanical systems. Encourage installation of solar panels for new residential and commercial development.
- Locate sensitive receptors more than 500 feet of a freeway, 500 feet of urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
- Locate sensitive receptors more than 1,000 feet of a major diesel rail service or railyards. Where adequate buffer cannot be implemented, implement the following:
  - Install air filtration (as part of mechanical ventilation systems or stand-alone air cleaners) to indoor reduce pollution exposure for residents and other sensitive populations in buildings that are close to transportation network improvement projects.
  - Use air filtration devices rated MERV-13 or higher.
- Plant trees and/or vegetation suited to trapping roadway air pollution and/or sound walls between sensitive receptors and the pollution source. The vegetation buffer should be thick, with full coverage from the ground to the top of the canopy.
- Install higher efficacy public street and exterior lighting.
- Use daylight as an integral part of lighting systems in buildings.
- Use passive solar designs to take advantage of solar heating and natural cooling.
- Install light-colored “cool” roofs, cool pavements.
- Install solar and tankless hot water heaters.
- Exclude wood-burning fireplaces and stoves.
- Incorporate design measures and infrastructure that promotes safe and efficient use of alternative modes of transportation (e.g., neighborhood electric vehicles, bicycles) pedestrian access, and public transportation use. Such measures may include incorporation of electric vehicle charging stations, bicycle lanes, bicycle-friendly intersections, and bicycle parking and storage facilities.
- Incorporate design measures that promote ride sharing programs (e.g., by designating a certain percentage of parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading and waiting areas for ride sharing vehicles, and providing a web site or message board for coordinating rides).

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for land use projects are cities and the County. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during operation where appropriate.

Significance After Mitigation

If implementing agencies adopt and require the mitigation described above, emission impacts would be reduced because said measures encourage the use of cleaner vehicles and reduce vehicle trips. Implementation of Mitigation Measures T-1(a), T-1(b), GHG-2, and GHG-4 would also reduce operational emissions from the proposed 2022 RTP/SCS. However, since the implementation is not project- or site-specific, reductions cannot be estimated and cannot be guaranteed on a project-by-project basis. Therefore, this impact would remain significant and unavoidable. No additional

feasible mitigation measures are available that would reduce daily emissions such that emissions would not contribute to existing nonattainment conditions in the SJVAB.

Threshold 3:	Expose sensitive receptors to substantial pollutant concentrations

Impact AQ-4 THE TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL PARTICULATE MATTER POLLUTANT CONCENTRATIONS. HOWEVER, BECAUSE THE PROPOSED 2022 RTP/SCS WOULD REDUCE EXPOSURE IN COMPARISON TO BASELINE CONDITIONS, IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Re-entrained dust refers to roadway dust that is "kicked up" by moving vehicles on paved and unpaved roadways. This type of dust would be generated by roadway activity under the proposed 2022 RTP/SCS. In addition, dust from construction activity would add to regional dust levels. The synergistic effects of road dust (typically measured as PM_{10}) with ozone and the hazardous constituents of re-entrained road dust itself (carcinogens, irritants, pathogens) may affect human heath by contributing to respiratory illnesses such as asthma and allergies. Although motor vehicle emission control advances have allowed vehicle tailpipe emissions of some pollutants to decrease over the last 20 years, the number of vehicles in use and the amount of vehicle activity has continued to increase. This would suggest that re-entrained road dust has increased as well, as the amount of re-entrained dust is related to the number of vehicles on a road.

Table 4.2-7 compares total particulate emissions for the baseline conditions in 2016 and 2046 with implementation of the proposed 2022 RTP/SCS.

Table 4.2-7 On-Road Mobile Source Particulate Matter Comparison

Scenario	PM_{10} Emissions (tons/day)	$PM_{2.5}$ Emissions (tons/day)
2016 Baseline	0.824	0.458
2046 with Proposed 2022 RTP/SCS	0.822	0.302
Net Change from 2016 Baseline	**(0.002)**	**(0.156)**
Percent Change from 2016 Baseline	**(0.2%)**	**(34.1%)**

Source: Appendix A

As shown in Table 4.2-7, total particulate emissions would be lower with implementation of the proposed 2022 RTP/SCS as compared to 2016 baseline conditions. Despite an increase in VMT within the SJCOG region, particulate emissions would be lower under proposed 2022 RTP/SCS conditions as compared to existing conditions largely due to emission control advances. Therefore, the proposed 2022 RTP/SCS would not expose sensitive receptors to substantial pollutant concentrations associated with re-entrained road dust, and impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Threshold 3:	Expose sensitive receptors to substantial pollutant concentrations

Impact AQ-5 THE TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL TAC CONCENTRATIONS. IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.

As described in Section 4.2.1, *Setting*, TACs are air pollutants that pose a potential hazard to human health by causing or contributing to an increase in mortality or serious illness. Common sources of TAC include high traffic freeways and roads, gas dispensing facilities, industrial facilities, and diesel engines. DPM is classified as the primary airborne carcinogen in California. CARB reports that diesel particulate matter represents about 70 percent of the potential cancer risk from vehicle travel on a typical urban freeway. To protect people from TACs and reduce exposure, CARB recommends avoiding siting new sensitive land uses, such as residences, schools, daycare centers, playgrounds, or medical facilities, within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day (CARB 2005).

According to the SJVAPCD GAMAQI, sensitive receptors are defined as people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling unit(s). The location of sensitive receptors is needed to assess toxic impacts on public health.

Several high traffic freeways and roads are located throughout the SJCOG region, including Interstates 5, 205, and 580 and State Routes 4, 12, 26, 33, 99, 88, 120, and 132. Within the SJCOG region, sensitive receptors residing close to freeways or busy roadways may experience adverse health effects beyond those typically found in urban areas. Because exposure of TACs is primarily based on local parameters (e.g., average daily traffic on local roadway segments and wind direction in relation to source and receptor), health risks adjacent to high volume roadways and transportation facilities would remain higher than regional averages.

As discussed above, the SJVAPCD significance threshold for long-term public health risk is set at 20 excess cancer cases in a million for cancer risk. For non-cancer risk (i.e., chronic or acute risk), the significance level is set at a hazard index of greater than 1.0. If a formal health risk assessment shows that a significant impact results, mitigation measures to reduce the predicted levels of toxic air pollutants from the facility to a less-than-significant level may be imposed by the lead agency.

To assess the impact of the proposed 2022 RTP/SCS on diesel emissions on regional roadways, an analysis of on-road mobile source diesel $PM_{2.5}$ and PM_{10} emissions (primary particulate matter) and diesel NO_X, (as a proxy for secondary PM_{10}) is shown in Table 4.2-8. This table compares baseline (2016) conditions with 2046 conditions with implementation of the proposed 2022 RTP/SCS. Projected emissions for 2046 with implementation of the proposed 2022 RTP/SCS would result in reductions of diesel NO_X, diesel $PM_{2.5}$, and diesel PM_{10} emissions. Because on-road diesel emissions with implementation of the 2022 RTP/SCS would decrease compared to baseline (2016) conditions, impacts related to diesel particulate matter exposure and associated health risks and nuisance odors at the regional level would be less than significant.

Table 4.2-8 On-Road Mobile Source Diesel Toxics Comparison

Scenario	Diesel $PM_{2.5}$ (tons/day)	Diesel PM_{10} (tons/day)	Diesel NO_X (tons/day)
2016 Baseline	0.26	0.27	11.98
2046 with Proposed 2022 RTP/SCS	0.05	0.06	4.08
Net Change from 2016 Baseline	**(0.21)**	**(0.21)**	**(7.90)**
Percent Change from 2016 Baseline	**(57%)**	**(57%)**	**(46%)**

Source: Appendix A

Diesel SO_X emissions would increase with implementation of the proposed RTP/SCS. However, overall SO_X from all on-road mobile sources would decrease (see Appendix A). Because diesel SO_X is a subset of overall SO_X, and overall emissions of this pollutant would decrease, it can be determined that diesel SO_X would not contribute to sensitive receptor exposure to substantial concentrations of pollutants. Therefore, impacts related to diesel SO_X are not of concern for this analysis.

Additionally, exposure is primarily based on local parameters such as average daily traffic (ADT) on local roadway segments, or wind direction in relation to source and receptor. As such, the health risks adjacent to heavily trafficked roadways and transportation facilities (e.g., Interstates 5, 205, and 580 and State Routes 4, 12, 26, 33, 99, 88, 120, and 132) would remain higher than regional averages. See Section 4.14, *Transportation*, for a summary of ADT on heavily trafficked roadways in the SJCOG region.

In the *Air Quality and Land Use Handbook: A Community Health Perspective* (2005), CARB recommends avoiding siting new sensitive land uses, such as residences, schools, daycare centers, playgrounds, or medical facilities, within 500 feet of a freeway, urban roads with more than 100,000 vehicles per day, or rural roads with more than 50,000 vehicles per day. California freeway studies show about a 70 percent drop-off in particulate pollution levels at 500 feet (CARB 2005). As discussed above, proximity to freeways increases cancer risk and exposure to particulate matter. Similarly, proximity to heavily travelled transit corridors and intersections would expose residents to higher levels of diesel particulate matter and carbon monoxide.

As discussed in Chapter 2, *Project Description*, as a result of proposed 2022 RTP/SCS policies and the proposed land use scenario, the anticipated growth pattern would facilitate improved circulation and expanded roadway networks, which could result in more people being exposed to elevated health risks as compared to areas of the region more distant from such activities. The location and pattern of the proposed 2022 RTP/SCS growth would influence travel behavior. An efficient and well-maintained circulation network facilitates a reduction in individual vehicle trips and associated congestion (refer to Section 4.14, *Transportation).* Reduced congestion and vehicle trips are directly linked to reduced regional criteria air pollutant emissions and toxic air emissions from mobile sources.

It is important to note that a variety of other factors contribute to the decline in contaminant emissions compared to existing conditions, including vehicle technology, cleaner fuels, and fleet turnover. However, in order to achieve the greatest VMT reductions from an efficient circulation network, development also must necessarily be in relatively close proximity to public transit and major roadway corridors. Although the precise location and density of such development is not known at this time, the proposed 2022 RTP/SCS could result in new sensitive receptors sited close to

existing and new TAC sources, potentially resulting in the exposure of sensitive receptors to substantial TAC concentrations. Therefore, impacts related to TAC emissions would be potentially significant. The siting of new sensitive receptors would be subject to an individual jurisdiction's land use approval processes and would be analyzed on an individual project basis and subject to mitigation measures identified below. The below mitigation measure would reduce this impact.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measure developed for the proposed 2022 RTP/SCS program where applicable for transportation projects that would result in fugitive dust and ozone precursor emissions. Cities and the County can and should implement this measure, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project-specific environmental documents may adjust this mitigation measure as necessary to respond to site-specific conditions.

AQ-4 Health Risk Reduction Measures

Transportation project sponsor agencies shall implement the following measures for projects that could facilitate an increase in vehicle trips:

- During project-specific design and CEQA review, the potential localized particulate (PM_{10} and $PM_{2.5}$) impacts and their health risks shall be evaluated for individual projects. Localized particulate matter concentrations shall be estimated using procedures and guidelines consistent with U.S. EPA 2015's *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*. If required based on the project-level hotspot analysis, project-specific mitigation shall be added to the project design concept or scope to ensure that local particulate (PM_{10} and $PM_{2.5}$) emissions would not reach a concentration at any location that would cause estimated cancer risk to exceed the SJVAPCD threshold of 20 in one million. Per the U.S. EPA guidance (2015), potential mitigation measures to be considered may include but shall not be limited to: providing a retrofit program for older higher emitting vehicles, anti-idling requirements or policies, controlling fugitive dust, routing traffic away from populated zones and replacing older buses with cleaner buses. These measures can and should be implemented to reduce localized particulate impacts as needed.
- For projects that do not meet screening criteria, retain a qualified air quality consultant to prepare a health risk assessment (HRA) in accordance with CARB and OEHHA requirements to determine the exposure of nearby residents to TAC concentrations.
- If impacts result in increased risks to sensitive receptors above significance thresholds, plant trees and/or vegetation suited to trapping TACs and/or sound walls between sensitive receptors and the pollution source.

In addition, consistent with the general guidance contained in CARB's *Air Quality and Land Use Handbook* (2005) and *Technical Advisory on Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways* (2017), cities and counties shall incorporate appropriate and feasible measures into project building design for land use projects, including residential, school and other sensitive uses located within 500 feet (or other appropriate distance as determined by the lead agency) of freeways, heavily travelled arterials, railways and other sources of diesel particulate matter, including roadways experiencing significant vehicle delays. The appropriate measures shall include one or more of the following methods, as appliable and as determined by a qualified professional.

The implementing agency shall incorporate health risk reduction measures based on an analysis of individual sites and project circumstances. These measures may include:

- Avoid siting new sensitive land uses within 500 feet of a freeway or railway.
- Require development projects for new sensitive land uses to be designed to minimize exposure to roadway-related pollutants to the maximum extent feasible through inclusion of design components including air filtration and physical barriers.
- Do not locate sensitive receptors near the entry and exit points of a distribution center.
- Locate structures and outdoor living areas for sensitive uses as far as possible from the source of emissions. As feasible, locate doors, outdoor living areas and air intake vents primarily on the side of the building away from nearby high-volume roadways or other pollution source. As feasible, incorporate dense, tiered vegetation that regains foliage year-round and has a long life span between the pollution source and the project.
- Maintain a 50-foot buffer from a typical gas dispensing facility (under 3.6 million gallons of gas per year).
- Install, operate, and maintain in good working order a central heating and ventilation (HV) system or other air take system in the building, or in each individual residential unit, which meets the efficiency standard of the MERV 13. The HV system should include the following features:
    - Installation of a high efficiency filter and/or carbon filter-to-filter particulates and other chemical matter from entering the building.
    - Use of either HEPA filters or ASHRAE 85 percent supply filters.
    - Completion of ongoing maintenance.
- Retain a qualified HV consultant or Home Energy Rating Systems rater during the design phase of the project to locate the HV system based on exposure modeling from the mobile and/or stationary pollutant sources.
- Maintain positive pressure within the building.
- Achieve a performance standard of at least one air exchange per hour of fresh outside filtered air.
- Achieve a performance standard of at least four air exchanges per hour of recirculation. Achieve a performance standard of 0.25 air exchanges per hour of unfiltered infiltration if the building is not positively pressurized.
- Require project owners to provide a disclosure statement to occupants and buyers summarizing technical studies that reflect health concerns about exposure to highway/freeway exhaust emissions.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during operation where appropriate.

Significance After Mitigation

Although implementation of the above mitigation would reduce health risks associated with TAC emissions, individual receptors may still be exposed to substantial TAC concentrations that would

have significant health risk effects. Therefore, this impact remains significant and unavoidable. No additional mitigation measures to reduce this impact to less-than-significant levels are feasible.

Threshold 4:	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people

Impact AQ-6 CONSTRUCTION OF THE TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD NOT RESULT IN OTHER EMISSIONS (SUCH AS THOSE LEADING TO ODORS) ADVERSELY AFFECTING A SUBSTANTIAL NUMBER OF PEOPLE. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

While offensive odors rarely cause physical harm, they can be unpleasant, leading to considerable distress among the public (SJVAPCD 2015a). The degree to which an odor is offensive is based on an individual's sensitivity and tolerance for said odor. Some people may find an odor acceptable (e.g., odors from a coffee roaster), while others may find it off-putting. Since odors are subjective, the sensory and physical response experienced by an individual varies based on their perception of the quality and intensity of the odor. Quality refers to the nature of the smell (e.g., flowery or sour) and intensity refers to the strength of the odor. Furthermore, the distance between the odor source and receptor, the wind direction, and sensitivity of the receptor can influence how the impact is perceived. Common sources of odors include landfills, agricultural uses, wastewater treatment plants, refineries, and vehicle exhaust.

Construction

Construction activities implementing the proposed 2022 RTP/SCS would generate oil and diesel fuel odors during construction from equipment use. The odors would be limited to the construction period and would be intermittent and temporary. Furthermore, these odors would dissipate rapidly with distance from in-use construction equipment. Accordingly, construction activities would not generate other emissions (such as those leading to odors) adversely affecting a substantial number of people. Impacts would be less than significant.

Operation

Development associated with the proposed 2022 RTP/SCS is related to transportation improvements such as roadway widening, interchange improvements, and installation of bicycle lanes. These types of projects are not typical operational sources of odors. However, all proposed 2022 RTP/SCS projects would be subject to SJVAPCD Rule 4102, *Nuisance*, which prohibits the discharge of air contaminants or other material that would cause injury, detriment, nuisance, or annoyance to any considerable number of persons. Furthermore, the projects would be required to adhere to local policies, zoning designations, and municipal codes that would limit odors. As discussed in Section 4.2.2, *Regulatory Setting*, the County of San Joaquin and cities within the SJCOG region have air quality-related policies in their General Plans that promote multi-modal transportation, electric-vehicles, and transit-oriented development. These types of policies aim to reduce travel with fossil-fueled vehicles and indirectly reduce odors from vehicle exhaust. However, if offensive odors are present and become a nuisance, complaints can be filed by email or phone call with SJVAPCD, who will then investigate the source. Because odorous emissions associated with the operation of the projects under the proposed 2022 RTP/SCS would be regulated by local governing bodies (i.e., SJVAPCD, County of San Joaquin, and local cities), implementation of the proposed 2022 RTP/SCS would not result in other emissions (such as odors) adversely affecting a substantial number of people. Impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

c. Specific RTP Projects That May Result in Impacts

The RTP/SCS projects listed in Section 2, *Project Description*, would have the potential to result in air quality impacts. All projects that include a construction component could result in the impacts described under Impact AQ-2. Projects that include roadway, rail, and transit features and/or expansions could result in the impacts described under Impacts AQ-3 and AQ-4. Additional specific analysis outlined in the above mitigation measures would need to be conducted as individual projects are designed and implemented to determine the magnitude of impacts. Because any number of the proposed 2022 RTP/SCS projects that require construction equipment or include transportation improvement would presumably increase air pollutant emissions, no specific projects are listed in this section related to the adverse impacts on air pollutant emissions in the SJCOG region.

4.2.4 Cumulative Impacts

For the purposes of evaluating cumulative impacts to air quality, the geographic scope of the cumulative impacts analysis is the SJVAB, which includes the SJCOG planning region as well as Kern, Kings, Fresno, Madera, Merced, Stanislaus, and Tulare counties. As detailed in Section 4.2.1(d), *Current Air Quality*, San Joaquin County is in nonattainment for federal ozone and $PM_{2.5}$ standards and state ozone, PM_{10}, and $PM_{2.5}$ standards. Because San Joaquin County is in nonattainment for these air quality standards, a cumulative air quality impact currently exists. Any growth within San Joaquin County would contribute to existing exceedances of ambient air quality standards. SJVAPCD has prepared air quality plans for both ozone and particulate matter to address this cumulative impact, improve conditions, and meet federal and state air quality standards. As stated in the SJVAPCD GAMAQI (2015), any proposed development project that would individually have a significant air quality impact related to criteria air pollutant emissions would also be considered have a cumulatively considerable contribution to existing significant cumulative impacts related to criteria air pollutant emissions. For TACs, the SJVAPCD GAMAQI (2015) states that because impacts from TACs are localized and the thresholds of significance for TACs have been established at such a conservative level, risks over the individual thresholds of significance are also considered cumulatively significant.

Construction activities associated with transportation projects under the proposed 2022 RTP/SCS, as well as the land use projects envisioned by the proposed 2022 RTP/SCS, would create fugitive dust and ozone precursor emissions and have the potential to result in temporary adverse impacts on air quality. As discussed under Impact AQ-2, although any individual improvement or development project may not generate significant short-term emissions, it is probable that several projects would be under construction simultaneously, generating cumulative construction emissions that could impact air quality. Short-term impacts would be significant because construction emissions could result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment. Implementation of Mitigation Measures AQ-2(a) through AQ-2(c) for individual projects would reduce PM and ozone precursor emissions. However, the contribution of construction emissions facilitated by the proposed 2022 RTP/SCS to the existing significant cumulative impact would remain cumulatively considerable and unavoidable because it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level.

As discussed under Impact AQ-3, regional ozone precursor and PM emissions from on-road mobile sources would decrease by 2046 with the proposed 2022 RTP/SCS compared to baseline 2016 conditions. As a result, the long-term operational mobile source emissions under the proposed 2022 RTP/SCS would not result in a cumulatively considerable contribution to existing significant cumulative air quality impacts. However, land use operational emissions would be cumulatively considerable before and after mitigation because land use projects under the proposed 2022 RTP/SCS may contribute to an increase in ozone precursor and PM emissions. As discussed under Impact AQ-5, impacts from TAC emissions would be cumulatively considerable despite a decrease in TAC emissions from baseline 2016 conditions because the proposed 2022 RTP/SCS may result in the siting of sensitive receptors in close proximity to existing or new sources of TACs. Mitigation Measure AQ-4 would reduce impacts from TACs; however, it cannot be guaranteed that impacts resulting from the proposed 2022 RTP/SCS can be mitigated to a less-than-significant level. Therefore, the impact would remain cumulatively considerable.

This page intentionally left blank.

4.3 Biological Resources

This section evaluates potential impacts to sensitive biological resources from development facilitated by the proposed 2022 RTP/SCS.

4.3.1 Setting

a. Vegetation Communities and Land Covers

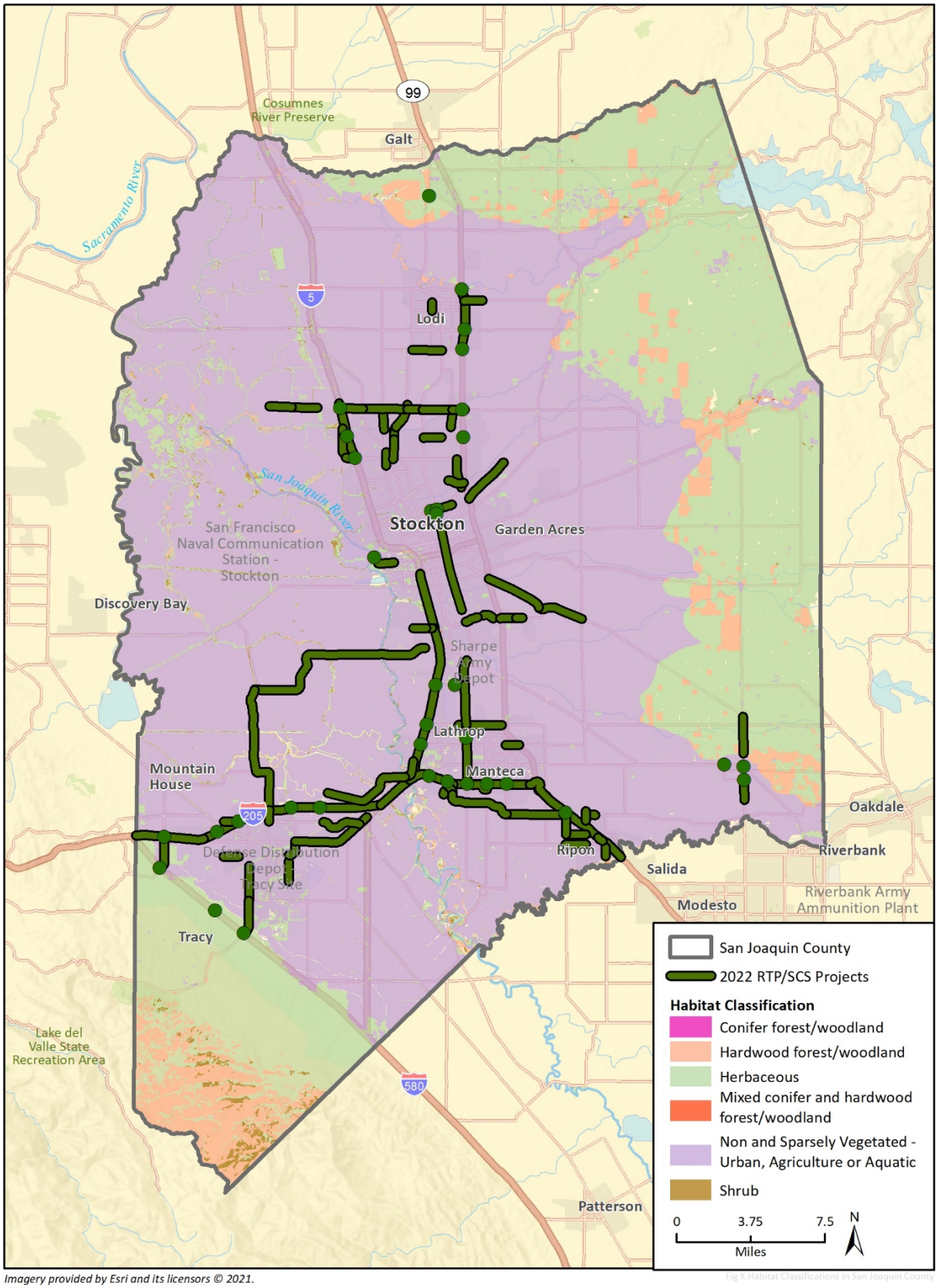
The SJCOG region contains a wide diversity of tree, scrub, estuarine, and herbaceous (grasslands, pastures, certain wetlands) vegetation communities and land covers. Thirty vegetation communities and land covers are mapped using the California Department of Fish and Wildlife (CDFW) – California Wildlife Habitat Relationships (CWHR) classification system within the SJCOG region (CDFW 2014). Of the thirty vegetation communities and land covers, nine are tree dominated, four are shrub dominated, two are herbaceous, ten are either developed, sparsely/non-vegetated or cropland, and five are drainages or wetlands (see Figure 4.3-1). Because of the scale of vegetation data at the regional level, the vegetation communities and land covers presented in Figure 4.3-1 depict a broad illustration of the distribution of CWHR categories (i.e., tree, shrub, herbaceous, etc.) found within the SJCOG region.

A description of each of the vegetation communities and land covers adapted from *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988) is presented below. The vegetation classifications from *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009) that most closely resemble those classified by the CWHR are also presented in each description where possible. It should be noted that these vegetation communities and land covers are generalized, and that site-specific variation is likely to be present. Also note that the CWHR classification system maps vegetation communities and land covers from a broad perspective and that in many areas it is expected that two or more vegetation communities and land cover types may blend with one another. Vegetation communities and land covers which occur within populated areas can also show variation because of a greater exposure to anthropogenic influences such as the introduction of exotic plant species.

Tree-Dominated Vegetation Communities

The SJCOG region is home to a variety of hardwood, coniferous, and mixed woodlands, and forests (see Figure 4.3-1). These tree-dominated vegetation communities can support diverse wildlife populations. Riparian vegetation communities are generally the terrestrial areas adjacent to freshwater bodies forming a vegetated corridor from stream edge to floodplain edge. Riparian vegetation communities occur in and along the major rivers (San Joaquin, Mokelumne, Calaveras, and Stanislaus Rivers), as well as along the many creeks, streams, and sloughs found in the SJCOG region. Riparian areas are rich in wildlife species, providing foraging, migration, roosting, and nesting/breeding habitat. The following are descriptions of types of tree-dominated vegetation communities that occur within the SJCOG region.

Figure 4.3-1 Vegetation Community Classifications in the SJCOG Region



Imagery provided by Esri and its licensors © 2021.
Additional data provided by CDFW, 2021.

Fig X Habitat Classifications in San Joaquin County

Blue Oak-foothill Pine

This vegetation community is typically diverse in structure both vertically and horizontally and is composed primarily of a mix of hardwoods, conifers, and shrubs. Shrub distributions tend to be clumped, with interspersed patches of annual grassland. Woodlands of this type generally tend to only have small accumulations of dead and downed woody material, compared with other tree vegetation communities in California. Blue oak (*Quercus douglasii*) and foothill pine (*Pinus sabiniana*) typically comprise the overstory of this vegetation communities, with blue oak usually most abundant. In the Coast Range, associated tree species include coast live oak (*Quercus agrifolia*), valley oak (*Quercus lobata*), and California buckeye (*Aesculus californica*). In rocky areas, interior live oak sometimes dominates the overstory especially on north-facing slopes at higher elevations. At lower elevations, where blue oaks make up most of the canopy, the understory tends to be primarily annual grasses and forbs. At higher elevations, where foothill pines and even interior live oaks sometimes comprise the canopy, the understory usually includes patches of shrubs in addition to the annual grasses and forbs. Shrub species that can be associated with this vegetation community include various buckbrush (*Ceanothus* spp.) species and manzanita (*Arctostaphylos* spp.). Other species found in this vegetation community can include California coffeeberry (*Frangula californica*), poison-oak (*Toxicodendron diversilobum*) and silver lupine (*Lupinus albifrons*). This vegetation community is generally located in the foothills of the Central Valley, between 500 and 3,000 feet in elevation. Blue oak-foothill pine vegetation community typically corresponds to the *Quercus douglasii* Woodland Alliance or *Pinus sabiniana* Woodland Alliance as described by Sawyer et al. (2009).

Blue Oak Woodland

Generally, these woodlands have an over story of scattered trees, although the canopy can be nearly closed. The canopy is dominated by broad-leaved trees 16 feet to 50 feet tall, commonly forming open savanna-like stands on dry ridges and gentle slopes. Blue oak is typically the dominant tree species. Shrubs such as poison oak, California coffeeberry, buckbrush (*Ceanothus cuneatus*), and redberry *(Rhamnus crocea*) are often present but rarely extensive and often occur on rock outcrops. Typical understory is composed of an extension of Annual Grassland vegetation described below. Blue oak woodland typically corresponds to the *Quercus douglasii* Woodland Alliance as described by Sawyer et al. (2009).

Eucalyptus Forest

Eucalyptus forest ranges from single-species thickets with little or no shrubby understory to scattered trees over a well-developed herbaceous and shrubby understory. In most cases, eucalyptus groves form a dense stand with a closed canopy. Blue gum eucalyptus (*Eucalyptus globulus*) and red gum eucalyptus (*Eucalyptus camaldulensis*) are the most common eucalyptus species found in these stands. The understory of these areas tends to have extensive patches of leaf litter with limited vegetation but may include species such as poison oak and toyon. Trees within this vegetation community are typically planted in rows for use as a wind break.

Juniper

This habit is characterized as woodlands of open to dense groupings of juniper (*Juniperus spp*.) trees in the form of treelike shrubs or small trees. Denser stands are commonly associated with a grassy understory. In California, this vegetation community has both cismontane and transmontane

associations and usually forms a band between lower desert scrub and higher sagebrush and pinyon-juniper woodlands (Sawyer et al. 2009).

Montane Hardwood

A typical montane hardwood is composed of a pronounced hardwood tree layer, with an infrequent and poorly developed shrub stratum, and a sparse herbaceous layer. In the Coast Range, canyon live oak (*Quercus chrysolepis*) often forms pure stands on steep canyon slopes and rocky ridge tops. It is replaced at higher elevations by scattered huckleberry oak (*Quercus vacciniifolia*) amongst an overstory of various conifers including ponderosa pine (*Pinus ponderosa*), Coulter pine (*Pinus coulteri*), California white fir (*Abies concolor*), and Jeffrey pine (*Pinus jeffreyi*). At mid-elevations, typical associates include Douglas-fir (*Pseudotsuga menziesii*), tanoak (*Notholithocarpus densiflorus*), Pacific madrone (*Arbutus menziesii*), California black oak (*Quercus kelloggii*), and bristlecone fir (*Abies bracteata*). At lower elevations knobcone pine (*Pinus attenuata*), foothill pine, Oregon white oak (*Quercus garryana*), and coast live oak are abundant. Understory vegetation is mostly scattered woody shrubs and a few forbs. Elevations range from 300 feet near the Pacific Ocean up to 9,000 feet. Montane hardwood typically corresponds to the *Quercus chrysolepis* Forest Alliance, as described by Sawyer et al. (2009).

Sierran Mixed Conifer

Dominant trees in Sierran Mixed Conifer include white fir, Douglas-fir, ponderosa pine, sugar pine, incense-cedar, and California black oak. White fir tends to be the most ubiquitous species (though most often a minor overstory component) because it tolerates shade. It occurs primarily at middle elevations in El Dorado County. Ponderosa pine dominates at lower elevations and on south slopes. Jeffrey pine commonly replaces ponderosa pine at high elevations, on cold sites, or on ultramafic soils. Red fir is a minor associate at the highest elevations. Deerbrush (*Ceanothus integerrimus*), chinquapin (*Chrysolepis chrysophylla*), squawcarpet (*Ceanothus prostrates*), mountain misery (*Chamaebatia foliolosa*), tanoak, manzanita, currants, and wood rose, are common shrub species in the shrub understory. Grasses and forbs associated with this vegetation community include over 100 species, including bromes, rushes (*Juncus* spp.), and purple needlegrass (*Nassella pulchra)*.

Valley Oak Woodland

This vegetation community can range in structure from savanna-like to forest-like stands. The canopies tend to be partially closed and comprised mostly of winter-deciduous, broad-leaved species such as valley oak. Dense stands typically grow in valley soils along natural drainages and decrease with the transition from lowlands to uplands. Shrubs are also associated with this Valley oak woodland in lowland areas, especially along drainages. Valley oak stands with little or no grazing tend to develop a partial shrub layer of bird disseminated species, such as poison oak, toyon (*Heteromeles arbutifolia*), and California coffeeberry. Ground cover consists of a well-developed carpet of annual grasses and forbs such as wild oat (*Avena* spp.), bromes (*Bromus* spp.), and ryegrass (*Festuca perennis*). Valley oak woodland typically corresponds to the *Quercus lobata* Woodland Alliance as described by Sawyer et al. (2009).

Valley-Foothill Riparian

This vegetation community is associated with drainages, particularly those with low velocity flows, flood plains, and gentle topography. Valley-foothill riparian is generally comprised of a canopy and sub-canopy tree layers dominated by valley oak, cottonwoods (*Populus* sp.), Oregon ash (*Fraxinus*

latifolia), white alder (*Alnus rhombifolia*), and boxelder (*Acer negundo*). The understory shrub layer comprises species such as willows (*Salix* spp.) wild grape (*Vitus californica*), wild rose (*Rosa californica*), blackberry (*Rubus* spp.), blue elderberry (*Sambucus cerulean*) and poison-oak.

Shrub Dominated Vegetation Communities

Shrub-dominated vegetation communities, such as chaparral and desert scrub, are comprised primarily of woody, evergreen shrubs and occur on the inner Coast Range, south of I-580 within the SJCOG region (see Figure 4.3-1). The following are descriptions of shrub-dominated vegetation communities that occur within the region.

Chamise-Redshank Chaparral

Regionally this chaparral type is dominated by pure or nearly pure stands of chamise (*Adenostoma fasciculatum*). Mature chamise-redshank chaparral is single layered, generally lacking well-developed herbaceous ground cover and over story trees. Shrub canopies frequently overlap, producing a nearly impenetrable canopy of interwoven branches. Fire occurs regularly in chamise-redshank chaparral and influences community structure. Within the SJCOG region, chamise-redshank chaparral typically corresponds to the *Adenostoma fasciculatum* Shrubland Alliance as described by Sawyer et al. (2009).

Desert Scrub

This vegetation community type generally has low species diversity and is typically composed of scattered groupings of broad-leaved evergreen or deciduous shrubs. Canopy cover in desert scrub is usually less than 50 percent and bare ground is often observed between plants. Scrub communities in the San Joaquin Valley have historically been dominated by saltbush (*Atriplex spinifera* and *A. polycarpa*) with a few other low-stature shrubs. However, currently this region is largely dominated by other exotic annual grasses and forbs and has large areas devoid of shrubs. This vegetation community is generally found below 4,000 feet.

Mixed Chaparral

Mixed chaparral is a structurally homogeneous brushland type dominated by shrubs with thick, stiff, heavily cutinized evergreen leaves. Shrub height and crown cover vary with age since last burn, precipitation, aspect, and soil type. At maturity, cismontane mixed chaparral typically is a dense, nearly impenetrable thicket. On poor sites, serpentine soils or transmontane slopes, shrub cover may be considerably reduced, and shrubs may be shorter. Leaf litter and standing dead material may accumulate in stands that have not burned for several decades. Mixed chaparral can correspond to multiple alliances as described by Sawyer et al. (2009) depending upon the species composition. These alliances can include, but are not limited to, *Ceanothus cuneatus* Shrubland Alliance and the *Arctostaphylos* spp. Shrubland Alliances.

Herbaceous Dominated Vegetation Communities

These vegetation communities are generally comprised of areas dominated by grasses and other non-woody species. Most of this type of vegetation in the SJCOG region is comprised of native and non-native grasslands. Native grasslands, which are dominated by perennial bunch grasses, such as purple needlegrass (*Nassella pulchra*), were historically abundant in the region but are now currently patchy in distribution statewide. The following are descriptions of the herbaceous dominated vegetation communities that occur within the SJCOG region.

Annual Grasslands

This vegetation community is composed primarily of non-native annual herbs and forbs and typically lacks shrub or tree cover. The physiognomy and species composition of annual grasslands is highly variable and varies considerably on a temporal scale. Grazing is a common land use within this vegetation community. Common grass species include wild oats, soft chess brome (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), and red brome (*Bromus madritensis*). Common forb species can include species of filaree (*Erodium* spp.), and bur clover (*Medicago polymorpha*). California poppy can also be quite common in this vegetation community. Annual grassland can correspond to multiple alliances as described by Sawyer et al. (2009) depending upon the species composition. These alliances can include, but are not limited to, *Avena* (*barbata, fatua*) semi-natural stands and *Bromus* (*diandrus, hordeaceus*) – *Brachypodium distachyon* semi-natural stands.

Perennial Grasslands

This vegetation community in California is found in coastal prairies under maritime influence and relics in communities dominated by annual grasses and forbs. This vegetation community is dominated by perennial grass species such as California oatgrass (*Danthonia californica*), Pacific hairgrass (*Deschampsia holciformis*), and sweet vernalgrass (*Anthoxanthum odoratum*). Grazing by domestic livestock or wild herbivores such as Roosevelt elk can substantially alter community structure through reduction of plant height and removal of biomass.

Developed, Sparsely/Non-Vegetated, and Cropland Land Covers

Developed, sparsely to non- vegetated, and cropland land covers are abundant in the SJCOG region (Figure 4.3-1). Developed land covers are usually sparsely or non-vegetated and are associated with urban and agricultural areas and are highly disturbed. Species that occur in these areas are typically adapted to anthropogenic disturbance and/or comprised of ornamental species. Sparsely vegetated land covers also tend to be associated with rock outcrops and cliffs. The following are descriptions of developed and sparsely/non-vegetated land covers that occur within the SJCOG region.

Cropland

This land cover is characterized by areas in active agriculture used to grow annual or perennial herbaceous crops and is entirely man-made. The structure of vegetation can vary in size, shape, and growing pattern. The dominant cropland use is row crops and can also include hay and grain. Subcategories of cropland classifications include, but are not limited to, dryland grain crop, irrigated hayfield crop and irrigated row and field crop, irrigated hayfield, rice, and pasture. Orchards and vineyards are classified separately.

Orchard/Vineyard

This land cover is characterized by typically open, single-species tree- or woody vine-dominated agricultural areas. Depending on the tree or vine type and pruning methods, they are usually low, bushy plants with an open understory to facilitate harvest. Trees such as citrus, avocados, and olives are evergreen, and other common tree crops such as walnuts and stonefruits are deciduous. The understory is usually composed of low growing grasses and other herbaceous plants but may be managed to prevent understory growth totally or partially, such as along tree rows. Vineyards, comprised of grape vines, also share similar characteristics. Subcategories of orchard/vineyard classifications include, but are not limited to, deciduous orchard and evergreen orchard.

Urban

This land cover is also completely man-made and is comprised of residential, commercial, and industrial developed areas. Plant species within urban areas are typically comprised of ornamental plants and non-native invasive plant species, with large, developed areas lacking vegetation.

Barren

This land cover is defined by the absence of vegetation. Any area with less than two percent total herbaceous vegetation cover and less than 10 percent relative cover by tree or shrub species is defined as barren (Mayer and Laudenslayer 1988). Structure and composition of the substrate is largely determined by the region of the state as well as surrounding environment. Examples of barren land cover include areas of exposed parent rock or talus.

b. Drainages and Wetlands

Drainages

Several large rivers end in the SJCOG region where they flow into the Delta. The largest of these, the San Joaquin River, divides into three channels as it enters the Delta: "Old River," "Middle River," and the "mainstem" of the San Joaquin River. The Mokelumne, Calaveras, and Stanislaus rivers are the other major rivers in the SJCOG region. Two additional major waterways, the Delta-Mendota Canal and the California Aqueduct, occur within the SJCOG region.

Several creeks and tributaries are associated with the riverine watersheds including Mormon Slough, Dry Creek, Corral Hollow, Hospital Creek, Lone Tree Creek, Little Johns Creek, Duck Creek, Mosher Slough, Bear Creek, Paddy Creek, and Potter Creek. The drainages within these watersheds are of biological importance as they provide valuable foraging habitat, breeding habitat, and movement corridors for a wide variety of animal species, including sensitive species such as delta smelt (*Hypomesus transpacificus*), riparian brush rabbit (*Sylvilagus bachmani riparius*), riparian woodrat (*Neotoma fuscipes riparia*), and California red-legged frog (*Rana draytonii*). Many of these rivers and their tributaries are also federally designated critical habitat for the delta smelt.

Wetlands

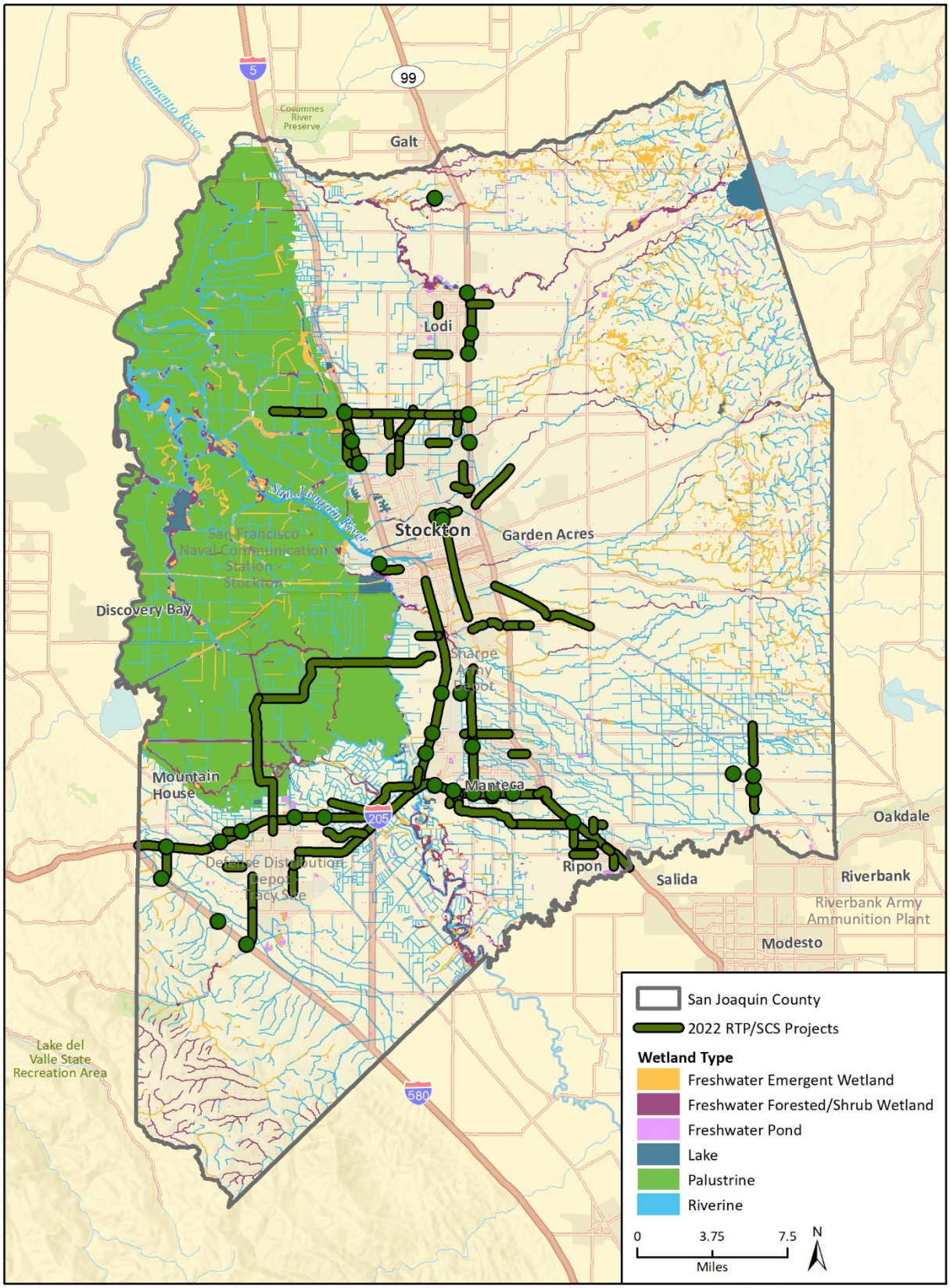
Wetlands are regarded as important biological resources both because of their rarity and because they provide a variety of ecosystem services. Several types of wetlands exist in the SJCOG region, including freshwater marshes, vernal pools, and riparian habitats. A map illustrating wetlands in the SJCOG region is shown in Figure 4.3-2.

In addition to vernal pools, several areas within the SJCOG region contain wetlands mapped by the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI; USFWS 2021a). A general description of each of the classifications used in the NWI is provided below. Of those wetland types mapped by the NWI, estuarine, fresh emergent wetland, lacustrine, riverine, and saline emergent wetland habitats are also mapped by the CWHR.

Vernal Pools

These seasonal wetlands are small depressions that fill with water during the winter, gradually drying during the spring and becoming completely dry in the summer. These pools are found in only a few places in the world outside of California. Vernal pool vegetation is adapted to the cycle of

Figure 4.3-2 Wetland and Drainages in the SJCOG Region



Imagery provided by Esri and its licensors © 2021.
Additional data provided by National Wetland Inventory, 2021.

brief inundation followed by seasonal drying. Vernal pools are characterized by herbaceous plants that may begin their growth as aquatic or semi-aquatic plants and transition to a dry land environment as the pool dries, while other species germinate in the mud as the pool begins to dry. Most vernal pool plants are annual herbs, many of which are endemic to vernal pools. Wildlife species supported by vernal pools include California tiger salamander *(Ambystoma californiense*) and vernal pool fairy shrimp (*Branchinecta lynchi*).

Freshwater Emergent Wetlands

Freshwater emergent wetlands include all non-tidal waters dominated by emergent herbaceous plant species, mosses, and/or lichens. Wetlands of this type are also low in salinity. The NWI also includes in this category wetlands that lack vegetation if they are less than 20 acres in size, do not have an active wave-formed or bedrock shoreline feature, have a low water depth less than 6.6 feet. Freshwater emergent wetlands are characterized by erect, rooted herbaceous hydrophytes. Dominant vegetation is generally perennial monocots. All emergent wetlands are inundated or saturated frequently enough that the roots of the vegetation prosper in an anaerobic environment. The wetlands may vary in size from small clumps to vast areas covering several kilometers. The acreage of Freshwater Emergent Wetlands in California has decreased dramatically since the turn of the century due to drainage and conversion to other uses, primarily agriculture.

Freshwater Forested/Shrub Wetlands

These wetlands include non-tidal waters that are dominated by trees and shrubs, with emergent herbaceous plants, mosses and/or lichens. The NWI also includes within this category wetlands that lack vegetation can be included in this class if they also exhibit the same criteria as described for freshwater emergent wetlands. Freshwater forested/shrub wetlands are generally dominated by woody vegetation such as shrubs and trees. This wetland category also can include riparian habitats.

Freshwater Ponds

Freshwater ponds include non-tidal waters, typically less than 20 acres in size and typically with vegetative cover along its edges such as trees, shrubs, emergent herbaceous plants, mosses, and/or lichens. Freshwater ponds can be man-made or natural and typically consist of an area of standing water with variable amounts of shoreline. These wetlands and deep-water habitats are dominated by plants that grow on or below the surface of the water. This wetland type is also mapped by the CWHR and categorized as lacustrine habitat which includes vernal pools; however, we have recognized vernal pools as unique features and thus provided a separate description that was previously presented.

Lakes

Lakes are a lacustrine system which includes wetlands and deep-water habitats that are located in a topographic depression or dammed river channel. These areas tend to be greater than 20 acres. Vegetation cover within this habitat is generally less than 30 percent and often occurs in the form of emergent or surface vegetation. Substrates are composed of at least 25 percent cover of particles smaller than stones.

Riverine

Riverine habitats are stream systems that include all wetlands and deep-water habitats contained in natural or artificial channels that contain periodically or continuously flowing water. This system

may also form a connecting link between two bodies of standing water. Substrates generally consist of rock, cobble, gravel, or sand. Features mapped as riverine wetlands in the NWI include drainages as previously described.

c. Special-Status Species

For the purpose of this EIR, special-status species are those plants and animals listed, proposed for listing, or candidates for listing as threatened or endangered by the USFWS under the federal Endangered Species Act; those listed or proposed for listing as rare, threatened, or endangered by the CDFW under the California Endangered Species Act (CESA); animals designated as "Species of Special Concern," "Fully Protected," or "Watch List" by the CDFW. Those plants ranked as California Rare Plant Rank (CRPR) 1 or 2 are typically regarded as rare, threatened, or endangered under CEQA by lead agencies and were considered as such in this EIR. The CRPR utilizes the following code definitions:

- **List 1A** = Plants presumed extinct in California
- **List 1B.1** = Rare or endangered in California and elsewhere; seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)
- **List 1B.2** = Rare or endangered in California and elsewhere; fairly endangered in California (20-80 percent occurrences threatened)
- **List 1B.3** = Rare or endangered in California and elsewhere, not very endangered in California (<20 percent of occurrences threatened, or no current threats known)
- **List 2** = Rare, threatened or endangered in California, but more common elsewhere

CRPR List 3 species are "review list," and CRPR 4 species are considered "watch list" species. CRPR 3 and 4 species do not typically warrant analysis under CEQA except where they are part of a unique community, from the type locality, or designated as rare or significant by local governments, or where cumulative impacts could result in population–level effects. The CRPR 3 and 4 species reported from the region are not locally designated as rare or significant by the County of San Joaquin General Plan or General Plans for incorporated cities within the SJCOG region and are not part of a unique community. Additionally, the SJCOG region is not known to be the type locality for any ranked plant species. Therefore, potential impacts to CRPR 3 and CRPR 4 species were not considered in this analysis.

Species of Special Concern (SSC) is a category used by the CDFW for those species which are considered indicators of regional habitat changes or are considered to be potential future protected species. Species of Special Concern do not have any special legal status except that which may be afforded by the Fish and Game Code. The SSC category is intended by the CDFW for use as a management tool to include these species into special consideration when decisions are made concerning the development of natural lands, and these species are considered sensitive as described under the CEQA Appendix G questions.

Queries of the USFWS Information, Planning and Conservation System (IPaC; USFWS 2021b), the CDFW California Natural Diversity Database (CNDDB) (CDFW 2021a), and California Native Plant Society (CNPS) *Online Inventory of Rare, Threatened and Endangered Plants of California* (CNPS 2021) were conducted. These queries were conducted to obtain comprehensive information regarding state and federally listed species considered to have potential to occur within the SJCOG region.

Special-status Plants and Animals

The SJCOG region is home to several species protected by federal and state agencies. Important animal species can be found in a variety of habitats in the SJCOG region. The CNDDB (CDFW 2021a), CNPS (2021), and USFWS IPaC (2021b) together list 91 special-status plant and animal species (34 plant species and 57 animal species [inclusive of special animals]) that occur or have potential to occur within the SJCOG region. The status and habitat requirements of those species are presented in Appendix B as Tables A-1 and A-2, respectively.

In addition, although not listed in the CNDDB, mountain lions (*Puma concolor*) are legally classified as "specially protected species." In July 2019, the Center for Biological Diversity petitioned CDFW to list mountain lions as threatened under the CESA within a proposed evolutionarily significant unit (ESU) located in Southern California and along the central coast of California. In April 2020, the Commission found that listing of this ESU may be warranted and designated mountain lion within the ESU as a candidate species under CESA. Mountain lions inhabit diverse habitats across most of California and can be found wherever deer are present, which includes the foothills and mountainous areas within the SJCOG region.

d. Sensitive Communities and Critical Habitat

Several natural communities considered sensitive by the CDFW occur within the SJCOG region (CDFW 2021a). The CNDDB lists eight natural communities that occur with the region. The Sensitive Natural Communities List in the CNDDB is not currently maintained and no new information has been added in several years. As such, the CDFW maintains a List of Vegetation Alliances and Associations[1] (CDFW 2020). According to the CDFW's Vegetation Program, Alliances with State ranks of S1-S3 are considered to be imperiled, and thus, potentially of special concern. Because this analysis is at the regional level and programmatic, vegetation mapping and analysis at the alliance and association level is not available at this time and would need to be conducted at the project level. That said, some sensitive vegetation alliances and associations are already known to occur within the SJCOG region as a subset of the habitats described above in Sections 4.3.1.a and 4.3.1.b. For instance, some oak woodland alliances within the SJCOG region, notably *Quercus lobata* Woodland Alliance, which most resembles the valley oak woodland described in Section 4.3.1.a, are considered sensitive.

Federally designated critical habitat for eight species also occurs in the SJCOG region (Figure 4.3-3). These sensitive communities and critical habitats are also listed in Table 4.3-1.

[1] CDFW classifies vegetation at the two finest levels of alliance and association. The alliance is defined by plant species composition, habitat conditions, physiognomy, and diagnostic species; at least one of the diagnostic species is typically found in the uppermost or dominant stratum (Jennings et al. 2009). The association is the most detailed classification level and reflects more specific characteristics of vegetation such as finer-level differences in species composition, topography, soils, substrate, climate, hydrology, and disturbance regime (FGDC 2008). Unlike alliances, associations often recognize two or more diagnostic species found in different vegetation layers (Sawyer et al. 2009).

Figure 4.3-3 Critical Habitat in the SJCOG Region

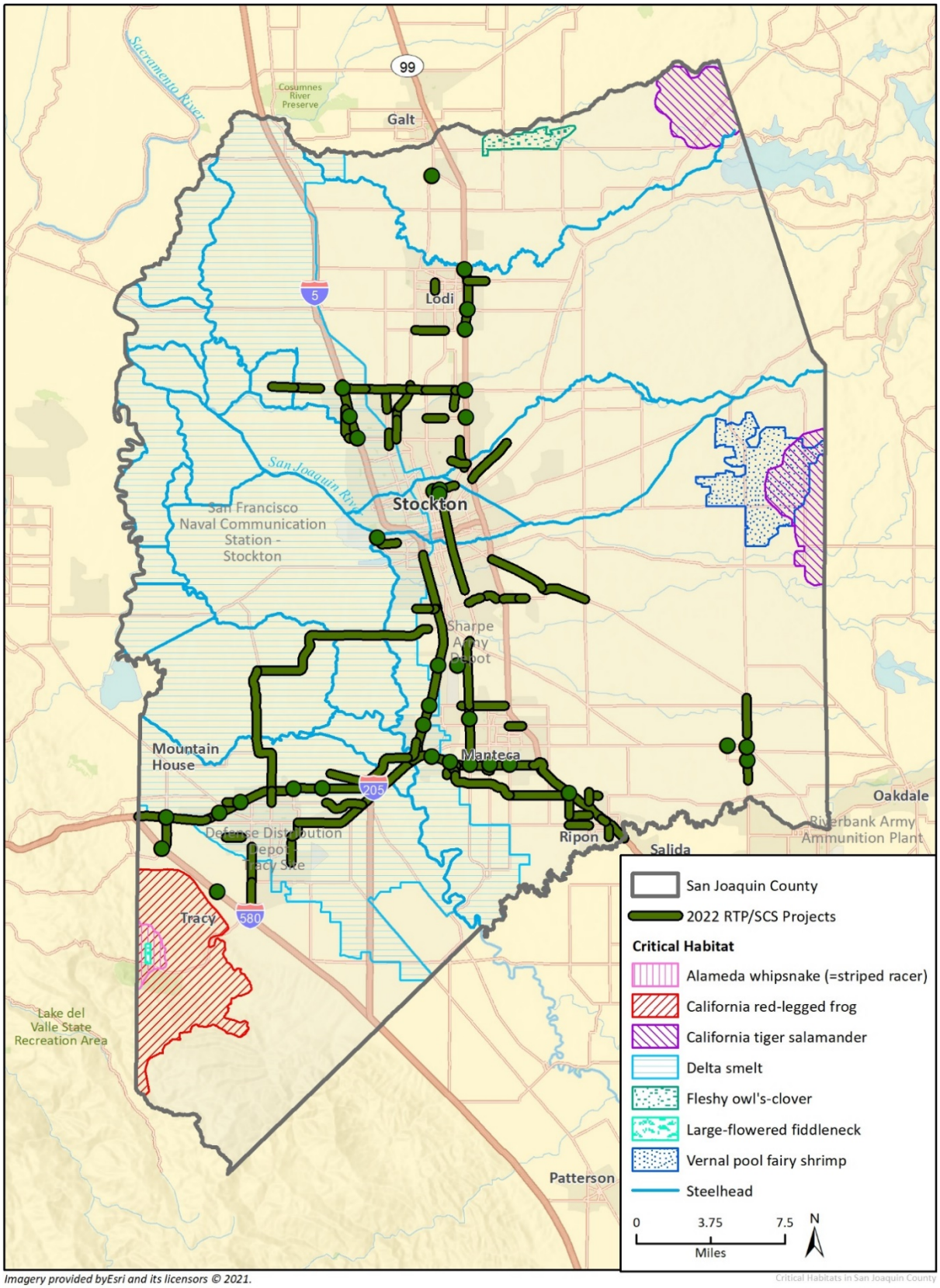


Table 4.3-1 Sensitive Communities and Critical Habitats Documented within the SJCOG Region

Communities Considered Sensitive by CDFW
Coastal and Valley Freshwater Marsh
Elderberry Savanna
Great Valley Cottonwood Riparian Forest
Great Valley Mixed Riparian Forest
Great Valley Oak Riparian Forest
Northern Claypan Vernal Pool
Northern Hardpan Vernal Pool
Valley Oak Woodland
Critical Habitats
Alameda whipsnake (=striped Racer) (*Masticophis lateralis euryxanthus*)
California red-legged frog (*Rana draytonii*)
California tiger salamander (*Ambystoma californiense*)
delta smelt (*Hypomesus transpacificus*)
fleshy Owl's-clover (*Castilleja campestris* ssp. *suculenta*)
large-flowered fiddleneck (Amsinckia grandiflora)
steelhead – Central Valley DPS (*Oncorhynchus mykiss irideus* pop. 11)
vernal pool fairy shrimp (*Branchinecta lynchi*)

Sources: CNDDB (CDFW 2021a); USFWS IPaC (2021b)

e. Wildlife Movement Corridors

Wildlife movement corridors, or habitat linkages, are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as providing a linkage between foraging and denning areas, or they may be regional in nature. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then subsequently return. Others may be important as dispersal corridors for young animals. A group of habitat linkages in an area can form a wildlife corridor network.

The habitats within the link do not necessarily need to be the same as the habitats that are being linked. Rather, the link merely needs to contain sufficient cover and forage to allow temporary inhabitation by ground-dwelling species. Typically, habitat linkages are contiguous strips of natural areas, though dense plantings of landscape vegetation can be used by certain disturbance-tolerant species. Depending upon the species using a corridor, specific physical resources (such as rock outcroppings, vernal pools, or oak trees) may need to be located within the habitat link at certain intervals to allow slower-moving species to traverse the link. For highly mobile or aerial species, habitat linkages may be discontinuous patches of suitable resources spaced sufficiently close together to permit travel along a route in a short period of time.

Wildlife movement corridors can be both large and small scale. Essential Connectivity Areas (ECA) as mapped in the report *California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California* (Spencer et al. 2010) represents connectivity at the state level. ECAs are regions in which land conservation and management actions should be prioritized to maintain and

enhance connectivity between areas of high ecological importance. ECAs are mapped based on coarse ecological condition indicators, rather than the needs of particular species and thus serve the majority of species in each region. It is important to recognize that even areas outside of Natural Landscape Blocks and ECAs support important ecological values and should not be immediately discounted as lacking conservation value without further review.

Four ECAs are mapped within the SJCOG Region (see Figure 4.3-4). The Mandeville Island-Staten Island ECA is located in the northwestern portion of the SJCOG region in the Delta. The Bear Slough-Browns Creek ECA is also located in the northwestern portion of the SJCOG region near the Consumes River Preserve. The remaining two ECAs, Bear Mountains-Duck Creek ECA and Duck Creek North Fork-Coyote Creek ECA overlap each other in the northeastern portion of the SJCOG region near Comanche Reservoir.

Small scale corridors important to wildlife movement are also present within the SJCOG region, many of which are not mapped as ECAs. These include the various rivers, creeks, drainages, and other topographic features that facilitate movement, such as the San Joaquin, Mokelumne, and Calaveras Rivers and other drainages as depicted in Figure 4.3-4. These corridors provide a means to facilitate regional connectivity for a number of wildlife species as a wildlife corridor. These areas are identified as important movement corridors for species such as San Joaquin kit fox (*Vulpes macrotis mutica*), steelhead (*Oncorhynchus mykiss irideus*), riparian birds, and other small carnivores. Additionally, the southwestern portion of the SJCOG region extends into the northern Diablo Mountain range which may serve as a movement corridor for the state provisionally protected Southern California/Central Coast evolutionarily significant unit (ESU) of mountain lion (*Puma concolor*).

4.3.2 Regulatory Setting

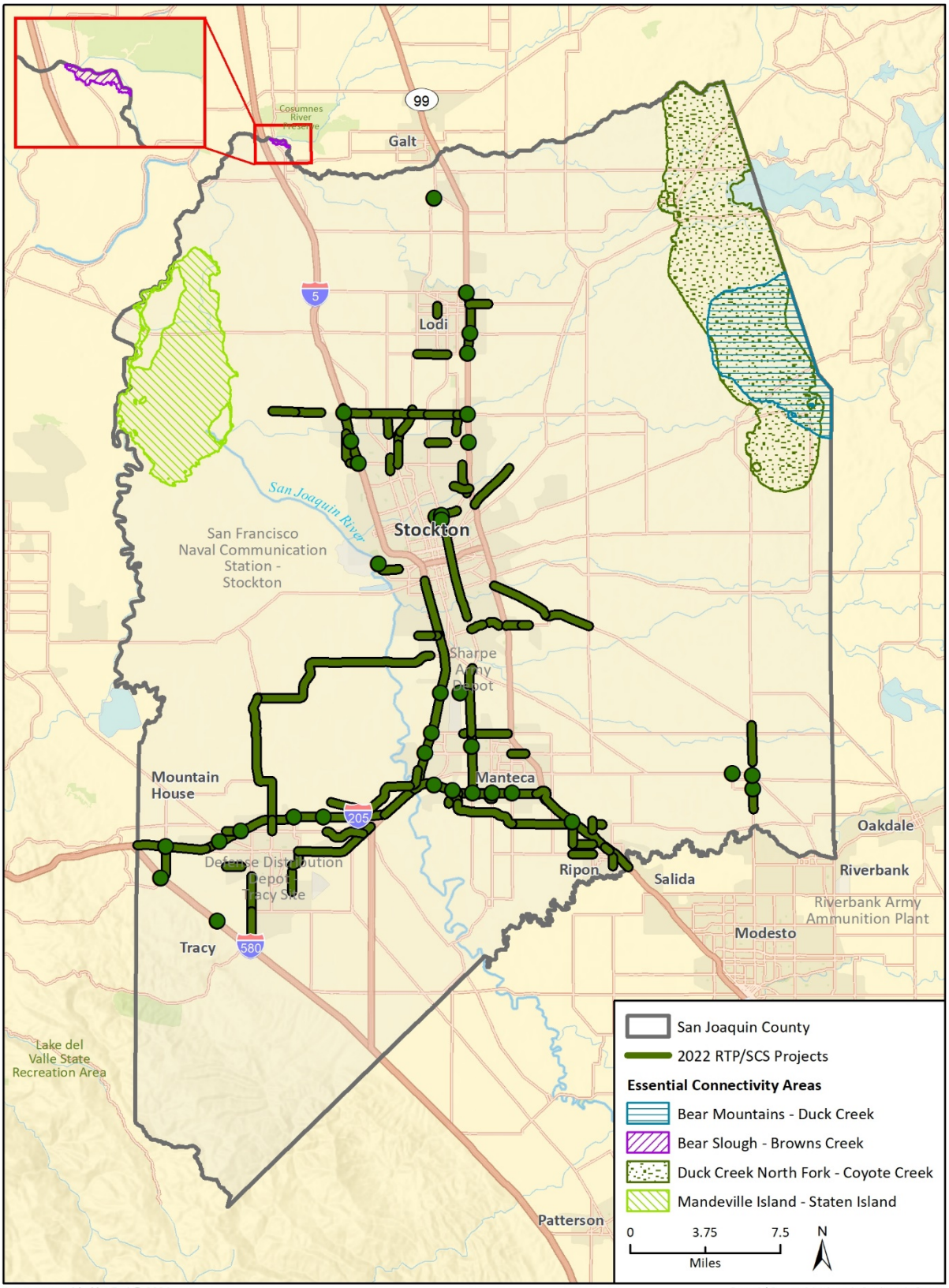
Federal, state, and local authorities under a variety of statutes and guidelines share regulatory authority over biological resources. The primary authority for general biological resources lies within the land use control and planning authority of local jurisdictions, which in this instance includes SJCOG, San Joaquin County, and the incorporated cities in the SJCOG region. The CDFW is a trustee agency for biological resources throughout the State under the California Environmental Quality Act (CEQA) and also has direct jurisdiction under the California Fish and Game Code (CFGC), which includes, but is not limited to, resources protected by the State of California under CESA.

a. Federal Laws, Regulations, and Policies

Endangered Species Act

Under the Federal Endangered Species Act (FESA), authorization is required to "take" a listed species. Take is defined under FESA Section 3 as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Under federal regulation (50 CFR Sections 17.3, 222.102); "harm" is further defined to include habitat modification or degradation where it would be expected to result in death or injury to listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Critical habitat is a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. FESA Section 7 outlines procedures for federal interagency cooperation to conserve federally listed species and designated critical habitat.

Figure 4.3-4 Essential Connectivity Areas in the SJCOG Region



Imagery provided by Esri © 2021.
Additional data provided by CDFW, 2021.

Essential Connectivity Areas in San Joaquin County

Section 7(a)(2) of FESA and its implementing regulations require federal agencies to consult with USFWS or National Marine Fisheries Service (NMFS) to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of critical habitat. For projects where federal action is not involved and take of a listed species may occur, the project proponent may seek to obtain an incidental take permit under FESA Section 10(a). Section 10(a) allows USFWS to permit the incidental take of listed species if such take is accompanied by an HCP that includes components to minimize and mitigate impacts associated with the take.

USFWS and NMFS share responsibility and regulatory authority for implementing FESA (7 USC Section 136, 16 USC Section 1531 et seq.).

Migratory Bird Treaty Act

The Migratory Bird Treaty Act authorizes the Secretary of the Interior to regulate the taking of migratory birds. The act provides that it is unlawful, except as permitted by regulations, "to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, […] any migratory bird, or any part, nest, or egg of any such bird" (16 USC Section 703(a)). The Bald and Golden Eagle Protection Act is the primary law protecting eagles, including individuals and their nests and eggs. The USFWS implements the Migratory Bird Treaty Act (16 United States Code [USC] Section 703-711) and the Bald and Golden Eagle Protection Act (16 USC Section 668). Under the Act's Eagle Permit Rule (50 CFR 22.26), USFWS may issue permits to authorize limited, non-purposeful take of bald eagles and golden eagles.

Clean Water Act

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (USACE), with EPA oversight, has authority to regulate activities that result in discharge of dredged or fill material into wetlands or other "waters of the United States." Perennial and intermittent creeks are considered waters of the United States if they are hydrologically connected to other jurisdictional waters. In achieving the goals of the Clean Water Act, the U.S. Army Corps of Engineers seeks to avoid adverse impacts and offset unavoidable adverse impacts on existing aquatic resources. Any discharge of dredged or fill material into jurisdictional wetlands or other jurisdictional "waters of the United States" would require a Section 404 permit from the USACE prior to the start of work. Typically, when a project involves impacts to waters of the United States, the goal of no net loss of wetlands is met by compensatory mitigation; in general, the type and location options for compensatory mitigation should comply with the hierarchy established by the Corp/EPA 2008 Mitigation Rule (USEPA 2021) (in descending order): (1) mitigation banks; (2) in-lieu fee programs; and (3) permittee-responsible compensatory mitigation. Also, in accordance with Section 401 of the Clean Water Act, applicants for a Section 404 permit must obtain water quality certification from the appropriate Regional Water Quality Control Board (RWQCB).

b. State Laws, Regulations, and Policies

Endangered Species Act and Fully Protected Species

California Endangered Species Act (CESA; Fish and Game Code Section 2050 et. seq.) prohibits take of State-listed threatened and endangered species without a CDFW incidental take permit. Take under CESA is restricted to direct harm of a listed species and does not prohibit indirect harm by way of habitat modification.

Protection of fully protected species is described in Fish and Game Code Sections 3511, 4700, 5050 and 5515. These statutes prohibit take or possession of fully protected species. Incidental take of fully protected species may be authorized under an approved NCCP or Habitat Conservation Plan (HCP). The San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) is the HCP for the SJCOG region.

California Fish and Game Code Sections 3503, 3503.5 and 3511

California Fish and Game Code sections 3503, 3503.5 and 3511 describe unlawful take, possession, or destruction of birds, nests, and eggs. Fully protected birds (CFGC Section 3511) may not be taken or possessed except under specific permit. Section 3503.5 of the Code protects all birds-of-prey and their eggs and nests against take, possession, or destruction of nests or eggs.

California Fish and Game Code Sections 1360-1372

Sections 1360 through 1372 of the California Fish and Game Code comprise the Oak Woodlands Conservation Act. The act was enacted to protect oak woodland habitats that were being diminished by development, firewood harvesting, and agricultural conversions. The Oak Woodlands Conservation Program was established as a result of the act and is intended to provide project funding opportunities for private landowners, conservation organizations, and cities and counties to conserve and restore oak woodlands. The program authorizes the Wildlife Conservation Board to purchase oak woodland conservation easements and provide grants for land improvements and oak restoration efforts. Section 21083.4 of CEQA requires counties to determine if a project within their jurisdiction may result in conversion of oak woodlands that would have a significant adverse effect on the environment. If the lead agency determines that a project would result in a significant adverse effect on oak woodlands, mitigation measures to reduce the significant adverse effect of converting oak woodlands to other land uses are required.

Native Plant Protection Act

The CDFW also has authority to administer the Native Plant Protection Act (NPPA) (CFGC Section 1900 et seq.). The NPPA requires the CDFW to establish criteria for determining if a species, subspecies, or variety of native plant is endangered or rare. Under Section 1913(c) of the NPPA, the owner of land where a rare or endangered native plant is growing is required to notify the department at least 10 days in advance of changing the land use to allow for salvage of the plant(s).

Section 1600 et seq. of the California Fish and Game Code

Section 1600 et seq. of the CFGC prohibits, without prior notification to CDFW, the substantial diversion or obstruction of the natural flow of, or substantial change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. In order for these activities to occur, the CDFW must receive written notification regarding the activity in the manner prescribed by the department and may require a lake or streambed alteration agreement. Lakes, ponds, perennial, and intermittent streams and associated riparian vegetation, when present, are subject to this regulation.

Natural Community Conservation Planning Act

The Natural Communities Conservation Planning (NCCP) Act was established by the California Legislature, is directed by the CDFW, and is implemented by the state, as well as public and private

partnerships to protect habitat in California. The NCCP Act takes a regional approach to preserving habitat. An NCCP identifies and provides for the regional protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity. Once an NCCP has been approved, CDFW may provide take authorization for all covered species, including fully protected species, Section 2835 of the CFGC.

Porter-Cologne Water Quality Control Act

The State Water Resources Control Board (SWRCB) and each of nine local RWQCB has jurisdiction over "waters of the State" pursuant to the Porter-Cologne Water Quality Control Act which are defined as any surface water or groundwater, including saline waters, within the boundaries of the State. SWRCB adopted a State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (Procedures), for inclusion in the forthcoming Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California. The Procedures consist of four major elements: 1) a wetland definition; 2) a framework for determining if a feature that meets the wetland definition is a water of the state; 3) wetland delineation procedures; and 4) procedures for the submittal, review, and approval of applications for Water Quality Certifications and Waste Discharge Requirements for dredge or fill activities (SWRCB 2021).

California Department of Transportation - California Streets and Highways Code Section 156.3

Assessments and remediation of potential barriers to fish passage for transportation projects using State or federal transportation funds are required. Such assessments must be conducted for any projects that involve stream crossings or other alterations and must be submitted to the CDFW. New projects must be constructed so that they do not present a barrier to fish passage

c. Regional and Local Laws, Regulations, and Policies

San Joaquin County Multi-Species Habitat Conservation and Open Space Plan

The SJMSCP was adopted by the San Joaquin Transportation Authority on November 14, 2000. The key purpose of the SJMSCP is to provide a strategy for balancing the need to conserve open space and the need to convert open space to non-open space uses while protecting the region's agricultural economy; preserving landowner property rights; providing for the long-term management of plant, fish, and wildlife species, especially those that are currently listed, or may be listed in the future, under the FESA or the CESA; providing and maintaining multiple open-spaces which contribute to the quality of life of the residents of the SJCOG region; and accommodating a growing population while minimizing costs to project proponents and society at large.

The SJMSCP is an HCP based on a 50-year planning horizon. An HCP is a federal and/or state planning document that is prepared pursuant to Section 10 of the FESA. An approved HCP within a defined plan area allows for the incidental take of federally listed species and habitat that are otherwise protected under FESA during development activities.

The SJMSCP compensates for conversions of open space for the several activities including transportation projects. These activities will be undertaken by both public and private individuals and agencies throughout the County and within the incorporated cities of Escalon, Lathrop, Lodi, Manteca, Ripon, Stockton, and Tracy. Public agencies including Caltrans and the San Joaquin Council

of Governments also will undertake activities related to transportation projects which will be covered by the SJMSCP.

SJCOG administers the SJMSCP, a voluntary mitigation plan, and holds the mitigation land. Project applicants are given the option of participating in the SJMSCP to streamline compliance with required local, state, and federal laws regarding biological resources, and typically avoid having to approach each agency independently. According to the SJMSCP, adoption and implementation by local planning jurisdictions provides adequate compensation and mitigation for impacts to plants, fish, and wildlife. SJMSCP-permitted activities within the boundaries of the SJCOG region fulfill conservation and open space obligations and policies of local general plans, resolution, ordinances, and other regulations as they pertain to plants, fish, and wildlife. Adoption and implementation of the SJMSCP also secures compliance pursuant to the state and federal laws such as CEQA, the National Environmental Policy Act (NEPA), the Planning and Zoning Law, the State Subdivision Map Act, the Porter-Cologne Act, and the Cortese-Knox Act regarding species covered under the SJMSCP. If an implementing agency chooses not to participate in the SJMSCP, it will be required to provide alternative mitigation in an amount and kind equal to that provided in the SJMSCP.

Land Use and Resource Management Plan

The Land Use and Resource Management Plan (LURMP) was adopted by the Delta Protection Commission (DPC) in 2010 to serve as a long-term resource management plan for land uses within the Primary Zone of the Delta as mandated by Public Resources Code section 29760 et seq. Approximately one-third of the SJCOG region is located within the Primary Zone, and therefore is subject to goal, policies, and standards set forth in the LURMP. For portions of the SJCOG region that are in the Secondary Zone, or outside of the legal Delta, the DPC may comment on projects that could impact Primary Zone resources. The cities of Stockton, Manteca, Lathrop, and Tracy lie within the Secondary Zone and have the potential to impact Primary Zone resources.

County and City General Plans

General Plans are created by cities and counties to guide the growth and land development of their communities. As such, General Plans typically contain elements which address protection of biological resources. These elements consist of goals, policies and actions that protect natural resources, such as environmentally sensitive habitats, special-status species, native trees, creeks, wetland, and riparian habitats. Local jurisdictions approve development as long as it is consistent with those elements of the General Plan.

Some resources are afforded protection via local ordinances such as those that protect trees, riparian corridors, and environmentally sensitive habitats. The County and incorporated cities within the SJCOG region have municipal codes which protect natural resources and addresses compliance with environmental regulations.

San Joaquin County General Plan 2035

The Natural and Cultural Resources Element of the San Joaquin County General Plan includes goals to protect the biological resources found within the County. The goals and policies of the General Plan are aimed at protecting and conserving listed species and their habitat, critical habitat, the Delta, and river environments. In addition, the General Plan includes a policy requiring the County to protect, preserve, and enhance important natural resource habitat, biological diversity, and the ecological integrity of natural systems in the County.

City General Plans and Regulations

The City of Stockton has numerous goals and policies related to biological resources in the Envision Stockton 2040 General Plan (2018) and the Stockton Municipal Code. The General Plan includes policies and actions to protect biological resources. Policy LU-5.2 requires that the City protect natural resource areas, fish and wildlife habitat, scenic areas, open space areas, agricultural lands, parks, and other cultural/historic resources from encroachment or destruction by incompatible development. This policy is achieved through Action LU-5.2A requiring compliance with the terms of the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) to protect critical habitat and special status species. Additionally, Action LU-2.5B requires projects on or within sites that have potential to contain special status species or their habitats to prepare a baseline assessment by a qualified biologist, and to avoid, if feasible, or minimize impacts to these resources through project design features or compensation in consultation with the qualified biologist. The Stockton Municipal Code contains includes Section 16.72.245, *Heritage Trees*, to provide for the protection and preservation of heritage trees within Stockton's limits. Under this section, it is unlawful for a heritage tree in the city to be harmed, injured, defaced, destroyed, or removed without first obtaining a permit from the Stockton Community Development Department in compliance with Chapter 16.130 of the Stockton Municipal Code, *Heritage Tree Permit*.

The City of Tracy contains a Biological Resources section of the Open Spaces and Conservation element of its 2025 General Plan, including several goals and policies related to protection of biological resources and sensitive habitats within the city (City of Tracy 2011). Goal OSC-1 is focused on protecting rare, endangered, and threatened plant and animal species throughout Tracy by preserving habitats that support these species (Objective OSC-1.1). Implementation Policies include OSC-P1 (meet regulations for habitat and species protection), OSC-P2 (participate with SJCOG to enforce the SJMSCP), OSC-P3 (incorporate native plantings in new development and reduce non-native species). The Tracy Municipal Code includes Chapter 7.08 to protect street trees and vegetation throughout the city and require permits from the Parks and Community Services Director prior to removal of any city street tree or shrubbery.

Other cities in the SJCOG Region, such as Manteca and Lodi, have similar provisions, goals, policies, and regulations in their General Plans and municipal ordinances.

4.3.3 Impact Analysis

a. Methodology and Significance Thresholds

Data used for this analysis included aerial photographs, topographic maps, the CNDDB, the CNPS online inventory of rare and endangered plants, accepted scientific texts to identify species and to generally characterize the existing conditions of the project sites. Federal special-status species inventories maintained by the USFWS were reviewed in conjunction with the CNDDB and CNPS online inventory. Potential disturbance associated with construction projects or land use development as discussed in 2022 RTP/SCS, were compared to the identified biological resource occurrences to determine whether an impact may occur.

Data on biological resources were collected from numerous sources, including relevant literature, maps of natural resources, and data on special-status species and sensitive habitat information obtained from the CDFW CNDDB (2021a), CDFW BIOS (2021b), CWHR (CDFW 2014), CNPS online Inventory of Rare and Endangered Plants of California (2021), and the USFWS IPaC (2021b). The USFWS NWI (2021a) and Critical Habitat Mapper (2021c) were also queried.

Appendix G of the State CEQA Guidelines identifies the following criteria for determining whether development facilitated by the proposed 2022 RTP/SCS would have a significant impact on biological resources, namely an analysis of whether or not the 2022 RTP/SCS would:

1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.
2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.
3. Have a substantial adverse effect on state or federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
4. 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.
5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with projects contained within the 2022 RTP/SCS. Section 4.3.3.c summarizes the impacts associated with capital improvement projects proposed in 2022 RTP/SCS. Due to the programmatic nature of the 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1:	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 or U.S. Fish and Wildlife Service

Impact BIO-1 IMPLEMENTATION OF TRANSPORTATION IMPROVEMENTS AND THE LAND USE SCENARIO ENVISIONED BY 2022 RTP/SCS MAY RESULT IN IMPACTS TO SPECIAL-STATUS PLANT AND ANIMAL SPECIES, EITHER DIRECTLY OR THROUGH HABITAT MODIFICATIONS. THIS IMPACT WOULD BE SIGNIFICANT BUT MITIGABLE.

For the purposes of this analysis, special-status plant and wildlife species include those designations described under Section 4.3.1.c above. Most of the transportation improvements proposed under 2022 RTP/SCS consist of minor expansions of existing facilities. However, these projects could affect areas occupied by special-status plant and wildlife species. As mentioned above, there are 91 special-status species known to occur or with potential to occur with the SJCOG region. Thirty of these species are given high levels of protection by the federal government through listing under

FESA or by the State government through listing under CESA or Fully Protected (wildlife only). The remaining species show in Tables A-1 and A-2 in Appendix B are protected through CEQA and/or through local ordinances. Most special-status species have very limited ranges within the SJCOG region and are associated with sensitive habitats, such as riparian habitats and drainages.

Because of the programmatic nature of 2022 RTP/SCS, a precise, project-level analysis of the specific impacts of individual transportation projects on special-status species is not possible at this time. As future transportation system improvement projects identified in the 2022 RTP/SCS are planned and designed, site-specific environmental review will be conducted by the agencies responsible for implementing such projects. However, some special-status species are expected to be encountered at the locations where projects administered under 2022 RTP/SCS would occur, and it is assumed that certain resources would not be avoided and that potentially significant impacts would occur.

Projects such as those that occur over or in the vicinity of rivers and creeks are within suitable habitat for species such as California red-legged frog (federally Threatened and State SSC) delta smelt (federally Threatened and State Endangered), riparian brush rabbit (federally Endangered and State Endangered), and riparian woodrat (federally Endangered and State SSC). Many of the creeks and rivers found within the SJCOG region are considered accessible by delta smelt and currently support or have historically supported delta smelt populations.

In addition to the rivers and creeks that may be impacted as described above, future transportation projects under 2022 RTP/SCS could impact upland habitats and the sensitive species that may occupy them. For example, San Joaquin kit fox (a federally Endangered and State Threatened species, may be present in grassland habitats near roads where projects could occur. The federally Threatened and State Threatened California tiger salamander can also occupy annual grassland habitats containing small mammal burrows if such habitat is within 1.24 miles (the dispersal distance of the species) of known or potentially suitable breeding habitat such as vernal pools and other seasonal ponds. Three special-status bat species may be affected by proposed projects where they occur under bridges or similar structures, or in native habitat adjacent to construction areas. Furthermore, the wide variety of habitats within the 2022 RTP/SCS area can support many species of nesting birds, including sensitive species such as the State Threatened Swainson's hawk (*Buteo swainsoni*) and the State SSC burrowing owl (*Athene cunicularia*). Disturbance of special-status plants could result in reductions in local population size, habitat fragmentation, or lower reproductive success.

Implementing agencies have the option to participate in the SJMSCP to reduce impacts to biological resources resulting from a proposed project to a level of less-than-significant if the proposed project is consistent with the SJMSCP. However, direct impacts to special-status species include injury or mortality occurring during implementation of projects under 2022 RTP/SCS. Direct impacts also include habitat modification and loss such that it results in the mortality or otherwise alters the foraging and breeding behavior substantially enough to cause injury. Indirect impacts could occur due to the spread of invasive non-native species that out-compete native species and/or alter habitat towards a state that is unsuitable for special-status species. For example, the spread of certain weed species can reduce the biodiversity of native habitats, potentially eliminating special-status plant species and reduce the availability of suitable forage and breeding sites for special-status wildlife species. Indirect impacts could also result due to increased access by humans and domestic animals, particularly in areas where trails may be planned. Increased human and domestic animal (especially dogs) presence foster the spread of non-native invasive plant species and disrupt the normal behaviors of animal species.

In addition to direct and indirect impacts that may result from transportation improvement projects, the 2022 RTP/SCS also contains a future land use scenario that emphasizes infill development and transit-oriented development (TOD). This land use scenario focuses future development concentrated in existing urbanized areas, which would minimize impacts to biological resources in non-urbanized areas. However, it is possible that sensitive plant and wildlife species would be located on future infill and TOD sites, as well as more undeveloped project sites. As a result, future development projects would impact plant and wildlife species that may be present on or in proximity to undeveloped areas. Many special-status wildlife species are associated with creeks even in the most densely developed urban areas. Both native and non-native trees and shrubs throughout urban areas may support nesting birds. Impacts of land use projects would be significant because substantial adverse effects on special-status species would occur.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures developed for the 2022 RTP/SCS program for applicable transportation projects that would result in biological resource impacts, and where feasible and necessary based on site-specific considerations. San Joaquin County and incorporated cities in the County can and should implement these measures where relevant to land use projects implementing 2022 RTP/SCS. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions.

BIO-1(a) Biological Resources Screening and Assessment

On a project-by-project basis, a preliminary biological resource screening shall be performed as part of the environmental review process to determine whether the project has any potential to impact biological resources. If it is determined that the project has no potential to impact biological resources, no further action is required. If the project would have the potential to impact biological resources, prior to construction, a qualified biologist shall conduct a biological resources assessment (BRA) to document the existing biological resources within the project footprint plus a buffer and to determine the potential impacts to those resources. The biological resources assessment shall evaluate the potential for impacts to all biological resources including, but not limited to: special-status species, nesting birds, wildlife movement, sensitive plant communities, critical habitat, Essential Fish Habitat, and other resources judged to be sensitive by local, state, and/or federal agencies. In addition, the assessment shall document potential modifications to existing infrastructure suitable for wildlife movement (e.g., culvert, underpass, etc.) Pending the results of the BRA, design alterations, further technical studies (i.e., protocol surveys) and/or consultations with the USFWS, CDFW and/or other local, state, and federal agencies may be required. If the project cannot be designed without complete avoidance, the sponsor agency shall coordinate with the appropriate regulatory agency (i.e., USFWS, NMFS, CDFW, USACE) to obtain regulatory permits and implement project - specific mitigation prior to any construction activities. The following mitigation measures [BIO-1(b) through BIO-1(j)] shall be incorporated only as applicable into the BRA for projects where specific resources are present or may be present and impacted by the project. Note that specific surveys described in the mitigation measures below may be completed as part of the biological resources assessment where suitable habitat is present. The results of the biological resources screening and assessment shall be provided to the implementing agency for review and approval.

BIO-1(b) Special-status Plant Species Surveys

If completion of the project-specific biological resources assessment determines that special-status plant species have potential to occur on-site, surveys for special-status plants shall be completed prior to any vegetation removal, grubbing, or other construction activity of each project (including staging and mobilization). The surveys shall be floristic in nature and shall be seasonally timed to coincide with the target species identified in the project-specific BRA. All plant surveys shall be conducted by a qualified biologist approved by the implementing agency no more than two years prior to project implementation. All special-status plant species identified on-site shall be mapped onto a site-specific aerial photograph or topographic map. Surveys shall be conducted in accordance with the most current protocols established by the CNPS, CDFW and/or USFWS. A report of the survey results shall be submitted to the implementing agency for review. If special-status plant species are identified, mitigation measure BIO-1(c) shall apply.

BIO-1(c) Special-status Plant Species Avoidance, Minimization, and Mitigation

If state or federally listed and/or CRPR 1 and 2 species are found during special-status plant surveys [pursuant to mitigation measure BIO-1(b)], then the project shall be re-designed to avoid impacting these plant species to the maximum extent feasible. Occurrences of these species that are not within the immediate disturbance footprint but are located within 50 feet of disturbance limits shall have bright orange protective fencing installed at least 30 feet beyond their extent, or other distance as approved by a qualified biologist, to protect them from harm. If CRPR 3 and 4 species are found, the biologist shall evaluate to determine if they meet criteria to be considered special-status, and if so, the same process as identified for CRPR 1 and 2 species shall apply.

If special-status plants species cannot be avoided and would be impacted by a project implemented under the 2022 RTP/SCS, all impacts shall be mitigated at a minimum ratio of 1:1 (number of acres or individuals restored to number of acres or individuals impacted) for each species as a component of habitat restoration. A restoration plan shall be prepared and submitted to SJCOG, and/or the local jurisdiction overseeing the project for approval. The restoration plan shall include, at a minimum, the following components:

- Description of the project/impact site (i.e., location, responsible parties, areas to be impacted by habitat type);
- Goal(s) of the compensatory mitigation project [type(s) and area(s) of habitat to be established, restored, enhanced, and/or preserved; specific functions and values of habitat type(s) to be established, restored, enhanced, and/or preserved];
- Description of the proposed compensatory mitigation site (location and size, ownership status, existing functions and values);
- Implementation plan for the compensatory mitigation site (rationale for expecting implementation success, responsible parties, schedule, site preparation, planting plan);
- Maintenance activities during the monitoring period, including weed removal as appropriate (activities, responsible parties, schedule);
- Monitoring plan for the compensatory mitigation site, including no less than quarterly monitoring for the first year (performance standards, target functions and values, target acreages to be established, restored, enhanced, and/or preserved, annual monitoring reports);
- Success criteria based on the goals and measurable objectives; said criteria to include numeric criteria to be selected based on the scale of the restoration effort and the restoration technique used:

  - At least 80 percent survival of container plants, and/or
  - Successful establishment the required number of individuals planted from seed to meet required replacement ratios; and/or
  - Sampling-based recruitment/survival criteria to achieve vegetative cover or total number of surviving individuals equal to at least 70 percent of the equivalent metric in reference sites for the same habitat type; sampling-based criteria must use a scientifically valid vegetation sampling method;

- An adaptive management program and remedial measures to address any shortcomings in meeting success criteria;
- Notification of completion of compensatory mitigation and agency confirmation; and
- Contingency measures (initiating procedures, alternative locations for contingency compensatory mitigation, funding mechanism).

BIO-1(d) Endangered/Threatened Species Habitat Assessment and Protocol Surveys

Specific habitat assessment and survey protocol surveys are established for several federally and/or state endangered or threatened species. If the results of the biological resources assessment determine that suitable habitat may be present for any such species, protocol habitat assessments/surveys shall be completed in accordance with CDFW and/or USFWS/NMFS protocols prior to issuance of any construction permits/project approvals.

Alternatively, in lieu of conducting protocol surveys, the implementing agency may choose to assume presence within the project footprint and proceed with development of appropriate avoidance measures, consultation, and permitting, as applicable.

If the target species is detected during protocol surveys, or protocol surveys are not conducted and presence assumed based on suitable habitat, mitigation measure BIO-1(e) shall apply.

BIO-1(e) Endangered/Threatened Species Avoidance and Compensatory Mitigation

If habitat is occupied or presumed occupied by federal and/or state listed species and would be impacted by the project, the implementing agency shall re-design the project in coordination with a qualified biologist to avoid impacting occupied/presumed occupied habitat to the maximum extent feasible. Disturbance limits shall have bright orange protective fencing installed at least 50 feet beyond their extent, or other distance as approved by a qualified biologist, to protect the habitat. If occupied or presumed occupied habitat cannot be avoided, the implementing agency shall provide the total acreages for habitat that would be impacted prior to the issuance of construction permits/approvals. The implementing agency shall purchase credits at a USFWS, and/or CDFW approved conservation bank and/or establish conservation easements or funds for acquisition of conservation easements as compensatory mitigation to offset impacts to federal and/or state listed species habitat.

Compensatory mitigation shall be provided at the following ratios for permanent impacts in accordance with the *San Joaquin County Multi-Species Habitat Conservation and Open Space Plan* (SJMSCP 2000) of not less than 1:1 (area mitigated: area impacted) for agricultural habitat lands and 3:1 for natural lands (non-wetland). Compensatory mitigation may be combined/nested with

special-status plant species and sensitive community restoration where applicable. Temporary impact areas shall be restored to pre-project conditions.

If the implementing agency establishes conservation easement(s) (on- and/or off-site) to serve as compensatory mitigation for federal and/or state listed species habitat impacts, compensatory mitigation areas shall have a restrictive covenant prohibiting future development/disturbance and shall be managed in perpetuity to encourage persistence and enhancement of the preserved target species. Compensatory mitigation lands cannot be located on land that is currently held publicly for resource protection. The compensatory mitigation areas shall be managed by a conservation lands management entity or other qualified easement holder. In addition, the implementing agency shall retain a qualified biologist to prepare a Habitat Mitigation and Monitoring Plan (HMMP) to ensure the success of compensatory mitigation sites that are to be conserved for compensation of permanent impacts to federal and/or state listed species. The HMMP shall identify long term site management needs, routine monitoring techniques, techniques, and success criteria, and shall determine if the conservation site requires restoration to function as a suitable mitigation site. If restoration is required on the conservation site, the HMMP shall contain the restoration components outlined under the Restoration Plan listed in measure BIO-1(c). The HMMP shall be submitted to the implementing agency for approval.

BIO-1(f) Endangered/Threatened Species Avoidance and Minimization

The following measures shall be applied to aquatic and terrestrial species, where appropriate. Project sponsors shall select from these measures as appropriate depending on site conditions, the species with potential for occurrence, and the results of the biological resources screening and assessment (measure BIO-1[a]).

- Preconstruction surveys for federal and/or state listed species with potential to occur shall be conducted where suitable habitat is present by a qualified biologist not more than 48 hours prior to the start of construction activities. The survey area shall include the proposed disturbance area and all proposed ingress/egress routes, plus a 100-foot buffer. If any life stage of federal and/or state listed species is found within the survey area, the appropriate measures in the BO or Habitat Conservation Plan(HCP)/Incidental Take Permit (ITP) issued by the USFWS/NMFS (relevant to federal listed species) and/or the ITP issued by the CDFW (relevant to state listed species) shall be implemented; or if such guidance is not in place for the activity, the USFWS, NMFS and/or CDFW shall be consulted to determine the appropriate course of action. The results of the pre-construction surveys shall be submitted to the implementing agency for review and approval prior to start of construction.
- Ground disturbance shall be limited to the minimum necessary to complete the project. The project limits of disturbance shall be flagged. Areas of special biological concern shall have highly visible orange construction fencing.
- All projects occurring within/adjacent to aquatic habitats (including riparian habitats and wetlands) shall be completed between April 1 and October 31, to avoid impacts to sensitive aquatic species.
- All projects occurring within or adjacent to sensitive habitats that may support federally and/or state endangered/threatened species shall have a qualified biologist present during all initial ground disturbing/vegetation clearing activities. Once initial ground disturbing/vegetation clearing activities have been completed, said biologist shall conduct daily pre-activity clearance surveys for endangered/threatened species. Alternatively, and upon approval of the CDFW and/or USFWS or as outlined in project permits, said biologist may conduct site inspections at a

minimum of once per week to ensure all prescribed avoidance and minimization measures are begin fully implemented.

- No endangered/threatened species shall be captured and relocated without authorization from the CDFW and/or USFWS.
- If pumps are used for dewatering activities, all intakes shall be completely screened with wire mesh not larger than five millimeters to prevent animals from entering the pump system.
- If at any time during construction of the project an endangered/threatened species enters the construction site or otherwise may be impacted by the project, all project activities shall cease. At that point the USFWS, NMFS and/or CDFW shall be consulted to determine the appropriate course of action, or the appropriate measures implemented in accordance with the BO or HCP/ITP issued by the USFWS (relevant to federal listed species) and/or the ITP issued by the CDFW (relevant to state listed species) and work can then continue as guided by those documents and the agencies as appropriate.
- All vehicle maintenance/fueling/staging shall occur not less than 100 feet from any riparian habitat or water body. Suitable containment procedures shall be implemented to prevent spills.
- No equipment shall be permitted to enter wetted portions of any affected drainage channel.
- All equipment operating within streambeds (restricted to conditions in which water is not present) shall be in good conditions and free of leaks. Spill containment shall be installed under all equipment staged within stream areas and extra spill containment and clean up materials shall be located in close proximity for easy access.
- At the end of each workday, excavations shall be secured with cover, or a ramp shall be provided to prevent wildlife entrapment.
- All trenches, pipes, culverts, or similar structures shall be inspected for animals prior to burying, capping, moving, or filling.

BIO-1(g) Non-Listed Special-status Animal Species Avoidance and Minimization

Depending on the species identified in the BRA, measures shall be selected from among the following to reduce the potential for impacts to non-listed special-status animal species:

- Preconstruction clearance surveys shall be conducted within 14 days prior to the start of construction (including staging and mobilization). The surveys shall cover the entire disturbance footprint plus a minimum 100-foot buffer and shall identify all special-status animal species that may occur on-site. All non-listed special-status species shall be relocated from the site either through direct capture or through passive exclusion. A report of the preconstruction survey shall be submitted to the implementing agency for their review and approval prior to the start of construction.
- A qualified biologist shall be present during all initial ground disturbing activities, including vegetation removal, to recover special-status animal species unearthed by construction activities.
- Upon completion of the project, a qualified biologist shall prepare a final compliance report documenting all compliance activities implemented for the project, including the preconstruction survey results. The report shall be submitted within 30 days of completion of the project.
- If special-status bat species may be present and impacted by the project, within 30 days of the start of construction a qualified biologist shall conduct presence/absence surveys for special-status bats, in consultation with the CDFW, where suitable roosting habitat is present. Surveys

shall be conducted using acoustic detectors and by searching tree cavities, crevices, and other areas where bats may roost. If active bat roosts or colonies are present, the biologist shall evaluate the type of roost to determine the next step.

- If a maternity colony is present, all construction activities shall be postponed within a 250-foot buffer around the maternity colony until it is determined by a qualified biologist that the young have dispersed or as recommended by CDFW through consultation. Once it has been determined that the roost is clear of bats, the roost shall be removed immediately.
- If a roost is determined by a qualified biologist to be used by a large number of bats (large hibernaculum), alternative roosts, such as bat boxes if appropriate for the species, shall be designed and installed near the project site. The number and size of alternative roosts installed will depend on the size of the hibernaculum and shall be determined through consultations with the CDFW.
- If other active roosts are located, exclusion devices such as valves, sheeting or flap-style one-way devices that allow bats to exit but not re-enter roosts discourage bats from occupying the site.

BIO-1(h) Preconstruction Surveys for Nesting Birds

For construction activities occurring during the nesting season (generally February 1 to September 15), surveys for nesting birds covered by the CFGC, the MBTA, and Bald and Golden Eagle Protection Act shall be conducted by a qualified biologist no more than 14 days prior to vegetation removal activities.

A qualified biologist shall conduct preconstruction surveys for raptors. The survey for the presence of bald and golden eagles, shall cover all areas within of the disturbance footprint plus a one-mile buffer where access can be secured. The survey area for all other nesting bird and raptor species shall include the disturbance footprint plus a 300-foot and 500-foot buffer, respectively.

If active nests (nests with eggs or chicks) are located, the qualified biologist shall establish an appropriate avoidance buffer ranging from 50 to 300 feet based on the species biology and the current and anticipated disturbance levels occurring in vicinity of the nest. The objective of the buffer shall be to reduce disturbance of nesting birds. All buffers shall be marked using high-visibility flagging or fencing, and, unless approved by the qualified biologist, no construction activities shall be allowed within the buffers until the young have fledged from the nest or the nest fails.

For bald or golden eagle nests identified during the preconstruction surveys, an avoidance buffer of up to one mile shall be established on a case-by-case basis in consultation with the USFWS and CDFW. The size of the buffer may be influenced by the existing conditions and disturbance regime, relevant landscape characteristics, and the nature, timing, and duration of the expected disturbance. The buffer shall be established between February 1 and September 15; however, buffers may be relaxed earlier than September 15 if a qualified ornithologist determines that a given nest has failed or that all surviving chicks have fledged, and the nest is no longer in use.

A report of these preconstruction nesting bird surveys and nest monitoring (if applicable) shall be submitted to the implementing agency for review and approval prior to the start of construction.

BIO-1(i) Fence and Signpost Restriction

Any fencing posts or signs installed temporarily or permanently throughout the course of the project shall have the top three post holes covered or filled with screws or bolts to prevent the entrapment of wildlife, specifically the talons of birds of prey. Also, fencing shall incorporate wildlife

friendly design elements, such as smooth wires and having a 6-inch or greater gap above grade. Fencing shall also be designed to be wildlife friendly (e.g., smooth top wire, smooth bottom wire at 6 inches above grade, etc.).

BIO-1(j) Worker Environmental Awareness Program (WEAP)

Prior to initiation of construction activities (including staging and mobilization), all personnel associated with project construction shall attend WEAP training, conducted by a qualified biologist, to aid workers in recognizing special-status resources that may occur in the project area. The specifics of this program shall include identification of the sensitive species and habitats, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. A fact sheet conveying this information shall also be prepared for distribution to all contractors, their employers, and other personnel involved with construction of the project. All employees shall sign a form documenting that they have attended the WEAP and understand the information presented to them.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. These mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction, as applicable.

Significance After Mitigation

Compliance with the above mitigation measures would reduce impacts to special-status species and their habitat to less than significant levels because the mitigation measures require pre-project surveys and biological monitoring, focused biological surveys, avoidance or minimization of project related disturbance or loss of special-status species, compensation for disturbed or loss of special-status species habitat and coordination with permitting agencies, as required prior to project implementation.

Threshold 2:	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service
Threshold 3:	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

Impact BIO-2 IMPLEMENTATION OF TRANSPORTATION IMPROVEMENTS AND THE LAND USE SCENARIO ENVISIONED BY 2022 RTP/SCS MAY RESULT IN IMPACTS TO SENSITIVE HABITATS, INCLUDING STATE OR FEDERALLY PROTECTED WETLANDS. THIS IMPACT WOULD BE SIGNIFICANT BUT MITIGABLE.

Due to the programmatic nature of 2022 RTP/SCS, a precise, project-level analysis of the specific impacts of individual transportation projects on sensitive habitats is not possible at this time. However, several of the projects that may be implemented under 2022 RTP/SCS have the potential to impact sensitive habitats, as mapped on Figure 4.3-2. The extent and severity of the impacts is not known at this time, but some examples of potential impacts include, but are not limited to: construction and reconstruction/widening of bridges over rivers and creeks, including the San

Joaquin River, Mormon Slough, Little Johns Creek, and Duck Creek. These types of projects would have potential to impact riparian areas, as well as the water bodies. In addition, projects such as multi-use trails and bike paths may also involve development along riparian corridors. Riparian areas provide wildlife habitat, and movement corridors, enabling both terrestrial and aquatic organisms to move along river systems between areas of suitable habitat. Construction of the proposed facilities could have both direct impacts due to disturbance of riparian flora and fauna and indirect impacts due to increased erosion and sedimentation, which would adversely affect downstream water quality.

In addition, other sensitive habitats, including oak woodlands, could occur at locations of transportation improvement projects and land use development sites. As noted in Section 4.3.1.c, vegetation alliances with State ranks of S1-S3 are considered imperiled and thus, potentially of special concern and sensitive (CDFW 2020). Impacts to these sensitive communities, including oak woodlands, would be significant.

Direct impacts to sensitive habitats include loss of habitat during construction of the project. Indirect impacts include habitat degradation due to introduction of invasive plant species incidentally from construction equipment and through selection of invasive landscape plants, as well as through erosion of disturbed areas.

The future land use scenario envisioned by the 2022 RTP/SCS would concentrate development primarily within existing urbanized areas. As a result, future infill and TOD projects are likely to result in only limited impacts to riparian habitat or sensitive habitat, though areas that have been relatively free of ground disturbance may contain sensitive native habitats such as Elderberry Savanna, Northern Claypan Vernal Pool, Northern Hardpan Vernal Pool, Valley Oak Woodland, or other vegetation alliances and associations that are deemed sensitive by the CDFW. Furthermore, some areas mapped by CWHR as somewhat disturbed habitats, such as annual grasslands, may at the local scale include sensitive native vegetation with unique assemblages of native plants, such as areas dominated by native wildflowers, vernal pools, and native grasslands.

In conclusion, implementation of 2022 RTP/SCS would have substantial adverse impacts on sensitive habitats, including State and federally protected wetlands, and this impact is therefore significant.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures for applicable transportation projects that would result in biological resource impacts, and where feasible and necessary based on site-specific considerations. San Joaquin County and incorporated cities in the County should implement these measures, where relevant to land use projects implementing 2022 RTP/SCS. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions.

BIO-2(a) Aquatic Resources Jurisdictional Delineation and Impact Avoidance

If the results of measure BIO-1(a) indicates projects implemented under the 2022 RTP/SCS occur within or adjacent to wetland, drainages, riparian habitats, or other areas that may fall under the jurisdiction of the CDFW, USACE, and RWQCB, a qualified biologist shall complete an aquatic resources delineation in accordance with the requirement set forth by each agency. The result shall be submitted to the implementing agency, USACE, RWQCB, CDFW as appropriate, for review and approval, and the project shall be designed to minimize impacts to jurisdictional areas to the extent

feasible. The delineation shall serve as the basis to identify potentially jurisdictional areas to be protected during construction, through implementation of the avoidance and minimization identified in measure BIO-2(f).

If jurisdictional areas are expected to be impacted, then the RWQCB would require a Waste Discharge Requirements (WDR) permit and/or Section 401 Water Quality Certification (depending upon whether the feature falls under federal jurisdiction). If CDFW asserts its jurisdictional authority, then a Streambed Alteration Agreement pursuant to Section 1600 et seq. of the CFGC would also be required prior to construction within the areas of CDFW jurisdiction. If the USACE asserts its authority, then a permit pursuant to Section 404 of the Clean Water Act would likely be required.

BIO-2(b) Wetlands, Drainages, and Riparian Habitat Restoration

Impacts to jurisdictional drainages, wetlands and riparian habitat shall be mitigated in accordance with the SJMSCP at a minimum ratio of 2:1 preservation plus 1:1 creation for vernal pools within the *Vernal Pool Zone*, as mapped by the SJMSCP Zone Map, and at least 1:1 creation plus 2:1 preservation for wetlands other than vernal pools (acres of habitat restored to acres impacted) and shall occur on-site or as close to the impacted habitat as possible. A mitigation and monitoring plan shall be developed by a qualified biologist in accordance with the restoration plan component requirements in mitigation measure BIO-1(c) above and shall be implemented for no less than five years after construction of the segment, or until the implementing agency and/or the permitting authority (e.g., CDFW or USACE) has determined that restoration has been successful. Alternatively, mitigation shall be accomplished through purchase of credits from an approved wetlands mitigation bank.

BIO-2(c) Landscaping Plan

If landscaping is proposed for a specific project, a qualified biologist/landscape architect shall prepare a landscape plan for that project. This plan shall indicate the locations and species of plants to be installed. Drought tolerant, locally native plant species shall be used. Noxious, invasive, and/or non-native plant species that are recognized on the Federal Noxious Weed List, California Noxious Weeds List, and/or California Invasive Plant Council Inventory as moderate to highly invasive species shall not be permitted. Species selected for planting shall be regionally appropriate native species that are known to occur in the adjacent native habitat types.

BIO-2(d) Sensitive Vegetation Community Avoidance and Mitigation

If the results of measure BIO-1(a) indicates projects implemented under the 2022 RTP/SCS would impact sensitive vegetation communities, impacts to sensitive communities shall be avoided through final project design modifications. Bright orange construction fencing shall be placed a minimum of 30 feet outside the edge of areas of sensitive communities that will be retained prior to any initiation of ground disturbance activities and shall remain in place until construction is complete. No vehicles, person, materials, or equipment shall be allowed in protected areas.

If the implementing agency determines that sensitive communities cannot be avoided, impacts shall be mitigated on-site or offsite at a ratio of 1:1 for permanently impacted sensitive communities (habitat restored for habitat lost). Temporarily impacted areas shall be restored to pre-project conditions. A Restoration Plan shall be developed by a qualified biologist. The restoration plan shall be implemented for a period of not less than five years. Off-site habitat acquisition and off-site restoration and/or enhancement may be considered if onsite restoration is determined as

unachievable, as long as the off-site proposals result in equal compensatory value. Replacement ratios for off-site mitigation may be different than those required for onsite mitigation. The plan shall include, at a minimum, the same components in accordance with the restoration plan component requirements in mitigation measure BIO-1(c) above.

BIO-2(e) Invasive Weed Prevention and Management Program

Prior to start of construction for each project that occurs within or adjacent to native habitats, an Invasive Weed Prevention and Management Program shall be developed by a qualified biologist to prevent invasion of native habitat by non-native plant species. The plan shall be submitted to the implementing agency for review and approval. A list of target species shall be included, along with measures for early detection and eradication.

The plan, which shall be implemented by the project sponsor, shall also include, but not be limited to, the following measures to prevent the introduction of invasive weed species:

- During construction, the project shall make all reasonable efforts to limit the use of imported soils for fill. Soils currently existing on-site should be used for fill material. If the use of imported fill material is necessary, the imported material must be obtained from a source that is known to be free of invasive plant species.
- To minimize colonization of disturbed areas and the spread of invasive species, the contractor shall: stockpile topsoil and redeposit the stockpiled soil after construction or transport the topsoil to a permitted landfill for disposal.
- The erosion control/ restoration plans for the project must emphasize the use of native species that are expected to occur in the area and that are considered suitable for use at the project site.
- All erosion control materials, including straw bales, straw wattles, or mulch used on-site must be free of invasive species seed.
- Exotic and invasive plant species shall be excluded from any erosion control seed mixes and/or landscaping plant palettes associated with the proposed project
- All disturbed areas shall be hydroseeded with a mix of locally native species upon completion of work in those areas. In areas where construction is ongoing, hydroseeding shall occur where no construction activities have occurred within six (6) weeks since ground disturbing activities ceased. If exotic species invade these areas prior to hydroseeding, weed removal shall occur in consultation with a qualified biologist and in accordance with the restoration plan.

BIO-2(f) Wetlands, Drainages, and Riparian Habitat Best Management Practices During Construction

The following best management practices shall be required for development within or adjacent to wetlands, drainages, or riparian habitat:

- Access routes, staging, and construction areas shall be limited to the minimum area necessary to achieve the project goal and minimize impacts to other waters including locating access routes and ancillary construction areas outside of jurisdictional areas.
- To control sedimentation during and after project implementation, appropriate erosion control materials shall be deployed to minimize adverse effects on jurisdictional areas in the vicinity of the project.

- Project activities within the jurisdictional areas should occur during the dry season (typically between June 1 and November 1) in any given year, or as otherwise directed by the regulatory agencies.
- During construction, no litter or construction debris shall be placed within jurisdictional areas. All such debris and waste shall be picked up daily and properly disposed of at an appropriate site.
- All project-generated debris, building materials, and rubbish shall be removed from jurisdictional areas and from areas where such materials could be washed into them.
- Raw cement, concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic species resulting from project-related activities, shall be prevented from contaminating the soil and/or entering wetlands, drainages, or riparian habitat.
- All refueling, maintenance, and staging of equipment and vehicles shall occur at least 100 feet from bodies of water and in a location where a potential spill would not drain directly toward aquatic habitat (e.g., on a slope that drains away from the water source). Prior to the onset of work activities, a plan must be in place for prompt and effective response to any accidental spills.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. These mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction, as applicable.

Significance After Mitigation

The above mitigation measures require focused biological surveys, best management practices to avoidance or minimization impacts, compensation for disturbed or loss of sensitive communities and wetlands, and coordination with permitting agencies, as required, prior to project implementation. Compliance with the above mitigation measures and existing State, federal and/or local regulations would reduce impacts to sensitive communities and wetlands to less than significant levels.

Threshold 4:	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

Impact BIO-3 IMPLEMENTATION OF TRANSPORTATION IMPROVEMENTS AND THE LAND USE SCENARIO ENVISIONED BY 2022 RTP/SCS MAY SUBSTANTIALLY INTERFERE WITH WILDLIFE MOVEMENT, INCLUDING FISH MIGRATION, AND/OR IMPEDE THE USE OF NATIVE WILDLIFE NURSERY SITES. THIS IMPACT WOULD BE SIGNIFICANT AND UNAVOIDABLE.

As discussed above in Section 4.3.1, *Setting*, the SJCOG region contains four mapped ECAs (CDFW 2021b). These areas are composed primarily of wildlands located within the northwestern and northeastern portions of the SJCOG region. Additionally, several small scale and important local movement corridors include some agricultural and developed areas (mostly rural residential) along the various rivers, creeks, drainages, and other topographic features in the SJCOG region, such as the San Joaquin, Mokelumne, and Calaveras Rivers and other drainages as depicted in Figure 4.3-2.

Many of these smaller scale wildlife movement corridors are bisected by major roadways. As such, several transportation projects in the 2022 RTP/SCS may overlap with areas of mapped ECAs or other locally important wildlife movement corridors including rivers and watercourses within the region.

Large swaths of undeveloped areas within the SJCOG region provide vegetative cover suitable for the movement of many terrestrial wildlife species, including medium to large-sized, mobile mammals with relatively large home ranges, such as coyote, deer, bobcat, grey fox, and mountain lion, and also provide foraging and breeding habitat for many species. Wildlife species can move through these vegetated areas routinely with some species also using concrete-lined or earthen stormwater channels in the area for movement.

As previously discussed under Impacts BIO-1 and BIO-2, transportation improvement projects and the land use scenario envisioned by the 2022 RTP/SCS could occur within areas that support sensitive habitat (e.g., riparian areas, undeveloped natural areas). Direct and indirect disturbances to these areas could potentially interfere with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors within the SJCOG region.

Fragmentation of habitat by roads and development throughout the San Joaquin Delta and surrounding open space areas is already a serious issue, and retaining existing connectivity (e.g., roadless area) between large undeveloped areas is considered important for the long-term viability of wildlife populations in the area, and therefore is very desirable from the standpoint of conservation planning.

Even in more urbanized areas such as Stockton, Lodi, and Tracy, there are pockets of natural areas that are considered native wildlife nursery sites (e.g., San Joaquin River, Oak Grove Regional Park, and Mossdale Crossing Regional Park). These areas have the potential to support nesting birds and other breeding wildlife. Development projects are required to comply with CFGC sections (e.g., Sections 3503, 3503.5, 3513, and 4150); thus, it is unlikely that infill development or TOD accommodated under the 2022 RTP/SCS would result in the disturbance or destruction of active nest sites or the unauthorized take of birds or nongame mammals. Nevertheless, if development activities directly (e.g., cutting of trees or other vegetation, or removal of man-made structures containing an active bird nest or denning wildlife) or indirectly (e.g., if activities sufficiently harassed birds to cause nest abandonment) affect nesting birds and nongame mammals, a violation of the Fish and Game Code would result.

Larger predatory mammals known to occur in the SJCOG region do not travel in large groups requiring large swaths of land;[2] thus, the reduction in capacity of migratory corridors would be less than significant. Conversely, game species such as mule deer, would be confined to narrower movement channels, which could lead to a reduction in capacity and could present a more opportunistic situation for predators (i.e., may increase predation rates). If prey species are dispersing through a more confined corridor, this may provide a bottleneck of which a predator can take advantage, although there is no clear evidence that predation rates universally increase in a negative way due to corridors, and the relationship between predation and corridors is complex (Conservation Corridor 2021).

Development of wider roadways and associated infill development and TOD may also result in wildlife attempting to cross roadways at inopportune areas, (i.e., areas that are significantly

[2] This discussion is related to the carrying capacity of a movement corridor and not the home range requirement of a given large predatory mammal.

narrower and confined by steeper hillsides or other barriers). This potential shift may lead to an increase in road mortality. Thus, impacts to wildlife movement based on existing and post-project opportunities would be considered significant without incorporation of mitigation.

Direct impacts to wildlife include increased noise and human presence during construction, as well as increased trash which may attract predators to the project site and discourage wildlife use of surrounding natural habitat. Indirect impacts include invasion of natural habitats by non-native species and increased presence of humans and domestic animals over the long-term. These edge effects of development in and adjacent to open space have the potential to adversely affect wide ranging predators, such as mountain lions. In addition, transportation improvement projects could include new segments of fencing or walls that that could hinder wildlife movement.

The future land use scenario envisioned by 2022 RTP/SCS would encourage infill development and TOD within existing urbanized areas. Most of the future infill and TOD development projects would be placed on parcels that provide limited or no wildlife movement. However, even the elimination of limited wildlife movement could further isolate areas of native habitat occupied by both sensitive and common native wildlife species. Based on the above analysis, impacts related to transportation projects and impacts related to the future land use scenario envisioned by the 2022 RTP/SCS would be potentially significant.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures for applicable transportation projects that would result in biological resource impacts, and where feasible and necessary based on site-specific considerations. These measures in addition to Mitigation Measure BIO-1(i) under Impact BIO-1 to incorporate wildlife friendly design elements, would apply to any transportation projects under the 2022 RTP/SCS that would result in impacts to wildlife movement. San Joaquin County and incorporated cities in the County should implement these measures where relevant to land use projects implementing 2022 RTP/SCS. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions.

BIO-3(a) Project Design for Wildlife Connectivity

All projects including long segments of fencing and lighting shall be designed to minimize impacts to wildlife. Fencing or other project components shall not block wildlife movement through riparian or other natural habitat. Where fencing or other project components that may disrupt wildlife movement is required for public safety concerns, they shall be designed to permit wildlife movement by incorporating design features such as:

- A minimum 16 inches between the ground and the bottom of the fence to provide clearance for small animals;
- A minimum 12 inches between the top two wires, or top the fence with a wooden rail, mesh, or chain link instead of wire to prevent animals from becoming entangled; and
- If privacy fencing is required near open space areas, openings at the bottom of the fence measure at least 16 inches in diameter shall be installed at reasonable intervals to allow wildlife movement, or the fence may be installed with the bottom at least 16 inches above the ground level.

- If fencing or other project components must be designed in such a manner that wildlife passage would not be permitted, wildlife crossing structures such as overpasses, underpasses, culverts, etc., shall be incorporated into the project design as appropriate.
- Lighting installed as part of any project shall be designed to be minimally disruptive to wildlife (see mitigation measure AES-3(a) Roadway Lighting for lighting requirements)

BIO-3(b) Maintain Connectivity in Drainages

No permanent structures shall be placed within any drainage or river that would impede wildlife movement (i.e., no hardened caps or other structures in the stream channel perpendicular to stream flow be left exposed or at depth with moderate to high risk for exposure as a result of natural bed scour during high flow events and thereby potentially create impediments to passage).

In addition, upon completion of construction within any drainage, areas of stream channel and banks that are temporarily impacted shall be returned to pre-construction contours and in a condition that allows for unimpeded passage through the area once the work has been complete.

If water is to be diverted around work sites, a diversion plan shall be submitted to SJCOG and/or local jurisdiction for review and approval prior to issuance of project construction permits/approvals. The diversion shall be designed in a way as to not impede movement while the diversion is in place.

BIO-3(c) Construction Best Management Practices to Minimize Disruption to Wildlife

The following construction BMPs shall be incorporated into all grading and construction plans in order to minimize temporary disruption of wildlife, which could hinder wildlife movement:

- Designation of a 20 mile per hour speed limit in all construction areas.
- Daily construction work schedules shall be limited to daylight hours only.
- Mufflers shall be used on all construction equipment and vehicles shall be in good operating condition.
- All trash shall be placed in sealed containers and shall be removed from the project site a minimum of once per week.
- No pets are permitted on project site during construction.

Significance After Mitigation

Compliance with the above mitigation measures would reduce impacts to wildlife movement by requiring projects to be designed in a way that maintains connectivity. However, it cannot be guaranteed that movement of terrestrial species will not be impeded at the regional scale due to the large scale of the 2022 RTP/SCS. No additional feasible mitigation measures are available to reduce impacts on wildlife movement. Thus, this impact would remain significant and unavoidable.

Threshold 5:	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance

Impact BIO-4 IMPLEMENTATION OF TRANSPORTATION IMPROVEMENTS AND THE LAND USE SCENARIO ENVISIONED BY 2022 RTP/SCS WOULD NOT CONFLICT WITH ANY LOCAL POLICIES OR ORDINANCES PROTECTING BIOLOGICAL RESOURCES, SUCH AS A TREE PRESERVATION POLICY. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

Most municipalities in the SJCOG region have local ordinances and policies in place that protect native habitat and/or native and nonnative trees in urban landscapes, as well as in unincorporated County lands. These ordinances and policies vary in their definitions of protected trees (e.g., certain species, percent within the public right-of-way, aesthetically suitable, deep-rooted trees, or a combination thereof) and in the requirements for ordinance or policy compliance. In addition, counties and cities may have local ordinances or policies that are intended to protect other biological resources such as wetlands and drainages, riparian habitat, and other sensitive habitat areas.

Protected trees (i.e., heritage oaks) and other biological resources which are protected by city and/or County ordinances and/or policies are expected to be encountered at the locations where projects administered under the 2022 RTP/SCS would occur and therefore there is potential for conflict with local ordinances and/or policies. Most of the transportation projects in the 2022 RTP/SCS are expansions or maintenance of existing roads. Because ground disturbances would be fairly limited as a result, the potential removal of native trees and disturbances to other biological resources protected by local policies or ordinances are expected to be minimal for most projects.

In addition to potential conflicts with local policies and/or ordinances that may result from transportation improvement projects, 2022 RTP/SCS also contains a future land use scenario that emphasizes infill development and TOD. This land use scenario focuses future development concentrated in existing urbanized areas, although some development would occur in more undisturbed areas. This would reduce impacts to biological resources that are protected by city and/or County ordinances; however, there remains the potential for conflict with local policies and ordinances from development associated with the future land us scenario.

All future development projects potentially occurring within local jurisdictions as well as the transportation projects proposed for implementation under the 2022 RTP/SCS would be required to follow city and/or County development requirements, including compliance with local policies, ordinances, and applicable permitting procedures related to protection biological resources. Project-level analysis would identify potentially significant conflicts with local policies and ordinances as well as minimize, mitigate, or avoid those impacts through the design, siting, and permitting process; and provide mitigation for any significant impacts as a condition of project approval and permitting. Therefore, the potential for approved development projects under the future land use scenario as well as proposed transportation project to conflict with local policies or ordinances protecting biological resources is considered less than significant.

Mitigation Measures

Mitigation measures are not required because this impact would be less than significant.

Threshold 6:	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan

Impact BIO-5 IMPLEMENTATION OF THE TRANSPORTATION IMPROVEMENTS AND THE LAND USE SCENARIO ENVISIONED BY THE 2022 RTP/SCS WOULD NOT CONFLICT WITH THE PROVISIONS OF AN ADOPTED HABITAT CONSERVATION PLAN, NATURAL COMMUNITY CONSERVATION PLAN, OR OTHER APPROVED LOCAL, REGIONAL, OR STATE HABITAT CONSERVATION PLAN. IMPACTS WOULD BE SIGNIFICANT BUT MITIGABLE.

There is one adopted conservation plan within the SJCOG region. The SJMSCP was adopted by the San Joaquin Transportation Authority on November 14, 2000. The SJMSCP is intended to comprehensively minimize and mitigate impacts to the region's special-status plant and wildlife species. The SJMSCP estimates an overall habitat conversion of 109,302 acres of open space land to non-open space uses through the 50-year term of the SJMSCP.

The 2022 RTP/SCS would not alter land use designations in any way that would adversely affect known wildlife linkages, migration corridors, etc. within areas covered by the SJMSCP. Individual 2022 RTP/SCS transportation and development projects must comply with the SJMSCP. Land use and transportation projects included in the 2022 RTP/SCS would be reviewed on an individual basis to ensure that the biological impacts are within the parameters established by the SJMSCP. Implementing agencies have the option to participate in the SJMSCP to reduce impacts to biological resources resulting from a proposed project to a level of less-than-significant if the proposed project is consistent with the SJMSCP.

The small quantity of low–quality habitat loss associated with implementation of the 2022 RTP/SCS would be considered a less than significant effect because of the amount of similar and higher value vegetation communities and land cover types within the SJCOG region that are already held in conservation or designated as open space. However, due to the programmatic nature of this analysis, the extent and severity of potential conflicts with the SJMSCP is not known at this time. Therefore, implementation of Mitigation Measures BIO-1(a) through BIO-3(c) should be applied to each future project, as appropriate, that is tiering off from this Program EIR. Adherence to Mitigation Measure BIO-1(a) through BIO-3(c) in addition to individual 2022 RTP/SCS project review by lead agencies would ensure that impacts related to compliance with the SJMSCP remain less than significant and would ensure that projects as they are designed do not result in conflict with the SJMSCP.

Mitigation Measures

Implementation of Mitigation Measures BIO-1(a) through BIO-3(c) are required.

Significance After Mitigation

Implementation of Mitigation Measures BIO-1(a) through BIO-3(c) would reduce impacts to a less than significant level.

c. Specific RTP Projects That May Result in Impacts

Table 4.3-2 identifies those projects that may create biological resource impacts. Projects that may have potential impacts are illustrated on Figure 2-2 through Figure 2-9 in Section 2, *Project Description*. The individual projects listed below could create significant biological impacts but would not necessarily do so. Additional specific analysis will need to be conducted as the individual

projects are implemented to determine the actual magnitude of impact. Mitigation measures discussed above could apply to these specific projects.

Table 4.3-2 2022 RTP/SCS Projects with Potential to Impact Biological Resources

Project Title	Project Type	Description
Caltrans		
CT-1: SR 99/120 Connector Project Phase 1A	HWY	Widen the eastbound SR 120 to southbound SR 99 connector ramp from one lane to two lanes.
CT-2: I-205 Managed Lanes	HWY	Widen I-205 from 6 to 8 lanes from Alameda County line to Eleventh Street
CT-3: I-205 Managed Lanes	HWY	Widen I-205 from 6 to 8 lanes from Eleventh Street to MacArthur Drive
CT-4: I-205 Managed Lanes	HWY	Widen I-205 from 6 to 8 lanes from MacArthur Drive to I-5
CT-5: I-5 HOV Mossdale	HWY	Widen to add HOV lanes with HOV connector ramps to I-205 and SR-120
CT-6: SR-120	HWY	Widen 4 to 6 lanes
CT-7: SR-99 HOV	HWY	Widen 6 to 8 lanes including reconstruction of SR-99/Main Street and SR-99/Wilma Avenue interchanges and pedestrian overcrossing
CT-8: SR-99/120 Connector Project Phase 1B	HWY	Widen the northbound SR 99 to westbound SR 120 connector ramp from one-lane to two-lanes; Add an auxiliary lane in the existing median of westbound SR 120 from Main Street to SR 99; Convert the existing 99/120 separation structure to two lanes and construct a new separation structure to service the eastbound 120 to northbound 99 connector ramp
CT-9: I-5 HOV	HWY	Widen from 6 to 8 lanes including auxiliary lanes from hammer Lane to North of Eight Mile Road
CT-10: I-5 HOV	HWY	Widen 6 to 8 lanes from French Camp Road to Charter Way
CT-11: I-5 HOV	HWY	Widen 6 to 8 lanes from Louise Avenue to French Camp Road
CT-12: SR 99/120 Connector Project Phase 1C	HWY	Add braided off ramps from SR 99 and SR 120 to Austin Road; Add loop on ramp from Austin Road to northbound SR 99 and to westbound SR 120; Add auxiliary lane in each direction on SR 99 from SR 120 to approximately 1.9 mile south of Austin Road and relocate the frontage road
CT-13: SR 99 Widening	HWY	Widen 4 to 6 lanes, environmental only
CT-14: Caltrans Intercity Rail	Rail	In San Joaquin County between Escalon and Stockton, construct double main track, panelized turnouts, relocate/renew siding turnout, and realign existing trackage.
City of Escalon		
E-1: SR-120 / Brennan Avenue	ST/RDS	Intersection improvements
E-2: Ullrey Avenue /McHenry Avenue Intersection	ST/RDS	Reconstruct intersection, including addition of turn pockets, improvement of traffic signal and installation of train pre-emption system for UPRR railroad crossing/
E-3: Escalon BNSF grade separation	ST/RDS	Construct a grade separation in Escalon at the BNSF Railroad
City of Lathrop		
La-1: SR 120 at Yosemite Avenue/Guthmiller Road	HWY	Reconstruct interchange

Project Title	Project Type	Description
La-2: Golden Valley Parkway	ST/RDS	Construct new roadway parallel to I-5, 2 lanes from Brookhurst Boulevard to Stewart Road
La-3: Golden Valley Parkway	ST/RDS	Construct new roadway parallel to I-5, 4 lanes from Stewart Road to Paradise Road
La-4: Golden Valley Parkway	ST/RDS	Widen from 2 to 4 lanes, from Brookhurst Boulevard to Stewart Road
La-5: Lathrop Transfer Station	Rail	Lathrop Transfer Station between ACE and Central Valley Service
City of Lodi		
Lo-1: SR-99 at SR-12 West (Kettleman Lane)	HWY	Reconstruct interchange and widen to free-flowing interchange
Lo-2: SR-99 at Harney Lane	HWY	Reconstruct interchange to provide 6 through lanes on SR-99, 4 lanes on Harney between Reynolds Ranch Parkway and SR-99 and modify on-ramps and off-ramps
Lo-3: SR-99 at Turner Road	HWY	Reconstruct interchange to provide operational and safety improvements on SR-99 at Turner Road
Lo-4: Harney Lane	ST/RDS	Widen from 2/3 lane collector to 4-lane divided arterial
Lo-5: Victor Road (SR-12)	ST/RDS	Widen from 2 to 4 lanes. Add center dual left turn lane, turn pockets at intersections and median separation with landscape
Lo-6: Ham Lane	ST/RDS	Widen 2/3 lanes to 4 lanes
Lo-7: Grapeline Capital	Transit	Transit station expansion
Lo-8: Southwest Transit Transfer Station	Transit	Construct transit transfer station in southwest Lodi
City of Manteca		
M-1: SR-120 at McKinley Avenue	HWY	Construct new interchange
M-2: SR-120 at Airport Way	HWY	Reconstruct interchange
M-3: SR-120 at Main Street	HWY	Reconstruct interchange
M-4: SR-99 at Raymus Expressway	HWY	Construction of new interchange – environmental only
M-5: Atherton Drive	ST/RDS	Construct new 4 lane roadway (gap closure)
M-6: Airport Way	ST/RDS	Widen from 2 to 4 lanes from SR-120 to Yosemite Avenue
M-7: Airport Way	ST/RDS	Widen from 2 to 4 lanes from Lathrop Road to Roth Road
M-8: Louise Avenue	ST/RDS	Widen from 2 to 4 lanes from Main Street to SR-99
M-9: Atherton Drive	ST/RDS	Construct new 4 lane roadway from McKinley Avenue to West of Airport Way
M-10: Lathrop Road	ST/RDS	Widen from 2 to 4 lanes from Est of UPRR to SR-99
M-11: Raymus Expressway	ST/RDS	Construct new 4 lane expressway from Main Street to SR-99
M-12: Airport Way	ST/RDS	Widen from 2 to 4 lanes from Yosemite Avenue to Lathrop Road
M-13: Raymus Expressway	ST/RDS	Construct new 2 lane expressway from ST-120 to Woodward Avenue
M-14: Atherton Drive	ST/RDS	Construct new 4 lane roadway from Woodward Avenue to McKinley Avenue
M-15: Raymus Expressway	ST/RDS	Construct new 2 lane expressway from Woodward Avenue to Main Street
M-16: Airport Way	ST/RDS	Widen from 4 to 6 lanes from SR 120 to Lathrop Road
M-17: Airport Way/UPRR	ST/RDS	Construct 5 lane grade separation over the UPRR

Project Title	Project Type	Description
M-18: Bus Maintenance and Storage Facility	Transit	Construct a bus maintenance and storage facility
City of Ripon		
R-1: Jack Tone Road, Phase 1	ST/RDS	Widen from 2 to 6 lanes from Santos Road to South Clinton Avenue
R-2: Garrison Road Gap Closure	ST/RDS	Construct 2 lane extension of Garrison Road
R-3: W. Ripon Road	ST/RDS	Widen from 2 to 6 lanes from Jack Tone Road to Olive Expressway
R-4: Canal Boulevard Extension	ST/RDS	Construct 4 lane extension of Canal Boulevard from Jack Tone Road to Olive Expressway
R-5: Olive Expressway	ST/RDS	Construct 6 lane Olive Expressway from Canal Boulevard to Raymus Expressway, environmental only
R-6: Transit Capital Improvements	Transit	Construct benches, shelters, and transit maintenance facility
R-7: Ripon Multimodal Station	Transit	Construct Multimodal Station
City of Stockton		
S-1: I-5 at Hammer Lane	HWY	Interchange modification and auxiliary lanes
S-2: I-5 at Otto Drive	HWY	Construction of a new interchange and auxiliary lanes
S-3: I-5 at Eight Mile Road	HWY	Modification of interchange
S-4: SR-99 at Eight Mile Road	HWY	Reconstruct interchange
S-5: SR-99 at Morada	HWY	Reconstruct interchange
S-6: Airport Way	ST/RDS	Intersection and operational improvements from Harding Way to Industrial Road
S-7: Morada Lane	ST/RDS	Widen from 3 to 6 lanes from West Lane to UPRR
S-8: Alpine Avenue	ST/RDS	Widen from 2 to 4 lanes with a middle turn lane. Construct curb, gutter, sidewalks, and driveways from UPRR (SPRR) to Wilson Way
S-9: Arch Road	ST/RDS	Widen from 2 to 6 lanes from Fite Court to Frontier Way
S-10: Arch Road	ST/RDS	Widen from 2 to 6 lanes from Frontier Way to SR-99
S-11: Maranatha Drive	ST/RDS	Construction of new 4 lane road from March Lane to Hammer Lane
S-12: Maranatha Drive	ST/RDS	Construction of new 4 lane road from Wilson Way to March Lane
S-13: Lower Sacramento Road	ST/RDS	Widen from 4 to 6 lanes from Armor Drive to Morada Lane
S-14: Lower Sacramento Road	ST/RDS	Widen from 2 to 6 lanes from Marlette Road to Pixley Slough
S-15: Lower Sacramento Road	ST/RDS	Widen from 4 to 6 lanes from Morada Lane to Hammer Lane
S-16: Eight Mile Road	ST/RDS	Widen from 2 to 4 lanes from New Road D to New Road F
S-17: Eight Mile Road	ST/RDS	Widen from 2 to 4 lanes from New Road F to New Road E
S-18: Eight Mile Road	ST/RDS	Widen from 5 to 6 lanes from I-5 to Thornton Road
S-19: Eight Mile Road	ST/RDS	Widen from 2 to 4 lanes from Thornton Road to Lower Sacramento Road
S-20: Eight Mile Road	ST/RDS	Widen from 2 to 6 lanes from Lower Sacrament Road to West Lane
S-21: Eight Mile Road	ST/RDS	Widen from 2 to 6 lanes from West Lane to Holman Road
S-22: Eight Mile Road	ST/RDS	Widen from 2 to 6 lanes from Holman Road to SR 99
S-23: Arch Road	ST/RDS	Widen from 2 to 6 lanes from Newcastle Road to Fite Court
S-24: French Camp Road	ST/RDS	Widen from 2 to 6 lanes from Wolfe Road to Manthey Road

Project Title	Project Type	Description
S-25: March Lane Extension	ST/RDS	Construction of new 8 lane road from Holman Road to SR 99
S-26: Mariposa Road	ST/RDS	Widen from 2 to 4 lanes from Stagecoach Road to Austin Road
S-27: Alpine Road/UPRR (east)	ST/RDS	Construct a 4-lane grade separation
S-28: Alpine Road/UPRR (west)	ST/RDS	Construct at-grade quiet zone improvements
S-29: West Lane at UPRR	ST/RDS	Construct a 6-lane grade separation
S-30: Stockton Diamond Grade Separation	Rail	In Stockton, construct track connections and grade separate the BNSF Stockton Subdivision and UPRR Fresno Subdivision diamond crossing
City of Tracy		
T-1: I-205/Lammers Road/Eleventh Street	HWY	Construct interchange I-205 at Eleventh Street, realign and widen Eleventh Street to 6-lanes north of Grant Line to Byron Road. Construct auxiliary lane Hansen to Eleventh, in westbound I-205 Eleventh Street to Grant Line Road.
T-2: I-580 at International Parkway/Patterson Pass Road	HWY	Reconstruct interchange
T-3: I-205 at Mountain House/International Parkway	HWY	Reconstruct interchange
T-4: I-205 Grant Line Road	HWY	Modification of existing interchange
T-5: I-205 at Chrisman Road	HWY	Phase I; Construct new interchange east-west ramps
T-6: I-205/MacArthur Interchange Modification	HWY	Modification of existing interchange – environmental only
T-7: I-580 at Corral Hollow Road	HWY	Modification of existing interchange – environmental only
T-8: I-580 at Lammers Road	HWY	Construction of new interchange – environmental only
T-9: I-580 at Iron Horse	HWY	Construction of new interchange – environmental only
T-10: International Parkway	ST/RDS	Widen from 2 to 4 lanes, including reconstruction of Delta-Mendota Canal and California Aqueduct bridges from I-205 to I-580
T-11: Corral Hollow Road	ST/RDS	Widen from 2 to 4 lanes from Parkside Drive to Linne Road
T-12: Schulte Road	ST/RDS	Extend 4 lane roadway from Faith Lane to Lammers Road
T-13: Grant Line Road	ST/RDS	Widen from 5 to 6 lanes from Naglee Road to Lammers Road
T-14: Corral Hollow Road Widening	ST/RDS	Widen 2 to 4 lanes including ROW and construction of two bridges from Linne Road to I-580
T-15: MacArthur Drive	ST/RDS	Extend 4 lane roadway on new alignment and construct railroad grade separation from Mt. Diablo Road to Eleventh Street
T-16: Tracy Boulevard	ST/RDS	Widen from 4 lane minor arterial to 4-lane major arterial from I-205 to Eleventh Street
San Joaquin County		
SJC-1: Howard Road	ST/RDS	Passing lanes and channelization from Tracy Boulevard to Matthews Road
SJC-2: Grant Line Road Corridor Improvements	ST/RDS	Realign roadway and widen from 2 to 4 lanes with operational and safety improvements from Tracy City Limits to 11th Street
SJC-3: Tracy Boulevard	ST/RDS	Passing lanes and channelization from I-205 to Howard Road
SJC-4: Eleventh Street	ST/RDS	Operational and safety improvements along corridor and at intersections from Tracy City limits to I-5

Project Title	Project Type	Description
SJC-5: Roth Road	ST/RDS	Widen from 2 to 4 lanes with shoulders from UPRR to Airport Way
SJC-6: Airport Way	ST/RDS	Widen from 2 to 4 lanes from Roth Road to French Camp Road
SJC-7: Escalon Bellota Road	ST/RDS	Widen from 2 to 4 lanes with shoulders from Escalon City Limits to Mariposa Road
SJC-8: Mariposa Road	ST/RDS	Widen roadway from 2 to 3 lanes and widen BNSF railroad grade separation from 2 to 4 lanes from Austin Road to Jack Tone Road
SJC-9: Lower Sacramento Road/UPRR (near Woodson Road)	ST/RDS	Replace grade separation of roadway and railway

Bike/Ped - Bicycle or Pedestrian
HWY – Highway
ST/RDS = Street or Roadway
Transit = Public Transportation Infrastructure
Various = Project/funding of different types

4.3.4 Cumulative Impacts

The cumulative impact analysis area for biological resources consists of the SJCOG region and adjoining counties. Information regarding these adjoining counties can be found in Section 3.1 – *Environmental Setting,* Table 3-1. Future development in this region that could impact biological resources is considered in the analysis. This cumulative extent is used to evaluate potential direct and indirect, and permanent and temporary impacts to special-status species, sensitive habitats, wildlife movement, local policies and ordinances protecting biological resources, and approved habitat conservation plans within the context of regional diminishment of these resources.

Biological resources impacts resulting from cumulative development within the cumulative impact analysis area would include direct and indirect impacts to sensitive/special status species or their habitat; impacts to riparian, wetland, or other sensitive natural communities; or interference with wildlife movement. Similarly, development pursuant to other local and regional planning efforts within the cumulative impact analysis area would impact these resources, and as a result, cumulative impacts would be significant. Due to the potential direct and indirect impacts that may occur, the 2022 RTP/SCS would contribute considerably to this significant cumulative impact.

Mitigation Measures BIO-1(a) through BIO-3(c) presented in Section 4.3.3.b set requirements for surveys and actions to be taken if biological resources have potential to be impacted by 2022 RTP/SCS projects as well as the future land use scenario. If implementing agencies and/or project sponsors adopt these mitigation measures and comply with existing State, local and/or federal regulations, the contribution of the proposed 2022 RTP/SCS to cumulative impacts would be reduced. However, as discussed above, the 2022 RTP/SCS contribution to significant cumulative impacts to special-status species and their habitats; riparian, wetland, or other sensitive natural communities; and wildlife movement remain cumulatively considerable post-mitigation.

2022 RTP/SCS projects and projects within the cumulative impact analysis area would be required to comply with ordinances and requirements protecting biological resources as well as the SJMSCP. Potential effects related to the SJMSCP and compliance with the applicable ordinances and requirements would be location-specific, and therefore would not result in a cumulative impact related to conflicts with local ordinances, plans, or the SJMSCP.

This page intentionally left blank.

4.4 Cultural Resources

This section evaluates potential impacts to cultural resources from development facilitated by the proposed 2022 RTP/SCS. Tribal Cultural Resources are addressed in Section 4.15.

4.4.1 Setting

The SJCOG region is located just east of the San Francisco Bay and is primarily situated within a region known as the Delta and Eastside Streams portion of the Central Valley in California (USGS 2021). The "Delta" is an estuary where, unlike classic deltas, multiple rivers come together, including the Sacramento, San Joaquin, Cosumnes, Mokelumne, and Calaveras Rivers. Topographically, the area consists of a low-elevation flatland with alluvial plains, river channels, old lakebeds, and marshes in the west to rolling hills in the east. Though land use in modern times is predominantly agriculture, prior to reclamation the area was once covered by extensive wetlands created by tidal action in the Delta, as well as seasonal flooding along streams (USGS 2021, Moratto 1984).

a. Archaeological Context

California prehistory is generally divided into three broad time periods: Paleoindian period (ca. 11,550-8,550 B.C), Archaic Period (8,550 B.C.-A.D. 1100) and Emergent Occupation (A.D. 1000-European Contact) (Fredrickson 1973, 1994; Moratto 1984; Rosenthal et al. 2007). The prehistoric chronological sequence for the Central Valley presented below is based on Rosenthal et al. (2007) and Moratto (1984).

Paleoindian Period (11,550-8550 B.C.)

Little is known about the Paleoindian period in the Central Valley. Geoarchaeological studies have demonstrated that erosion and deposition have buried or destroyed early archaeological deposits. Most claims of ancient human occupation have been dismissed by Moratto (1984) based on radiocarbon dating. Currently, the earliest accepted date of human occupation in the Central Valley ranges from 11,550 to 9,550 B.C. and comes from fluted projectile points similar to Clovis points found at sites near Tracy Lake and the Tulare Lake Basin (Rosenthal et al. 2007). The only known Paleoindian site in the Sacramento Valley is a single possible fluted point from near Thomes Creek (Rosenthal et al. 2007).

Lower Archaic (8,550-5,550 B.C.)

Climate change at the end of the Pleistocene caused significant periods of alluvial deposition beginning around 9,050 B.C. The Lower Archaic, like the Paleoindian Period, is represented only by limited isolated finds. One isolated flaked stone crescent was identified on an ancient alluvial fan west of Orland in the Sacramento Valley (Rosenthal et al. 2007). No other Lower Archaic sites have been identified within the Sacramento Valley.

Typical Lower Archaic artifacts include flaked stone crescents and stemmed points. The identification of projectile points and a diverse faunal assemblage at KER-116, (the only Lower Archaic site identified in the Central Valley to date), point to hunting being an important subsistence activity (Rosenthal et al. 2007). Milling tools and plant remains are largely absent in the valley, thus plant use during the Lower Archaic remains unclear. Several foothill sites contain milling implements and evidence of the use of nut crops such as acorn and pine (Lajeunesse and Pryor 1996). The

relationship between foothill and valley floor adaptations is largely unknown during the Lower Archaic. However, distinct adaptations are apparent in the Middle Archaic, and it is possible that these divergent traditions first emerged in the Lower Archaic (Rosenthal et al. 2007).

Middle Archaic (5,550-550 B.C.)

The Middle Archaic began with substantial climate change to much warmer, drier conditions. Fans and floodplains stabilized after an initial period of deposition in 5,550 B.C. Archaeological deposits dating to the Middle Archaic are rare in the Central Valley proper due to these geomorphic changes. In the Sacramento Valley, one site with an early Middle Archaic component has been identified but has not been excavated (Rosenthal et al. 2007). The late Middle Archaic, however, is relatively well-represented in the Sacramento Valley and Delta. Late Middle Archaic sites point to diverse adaptations and the emergence of organized subsistence practices and residential stability along river corridors by 6,000 years ago. The typical pattern of the Middle Archaic has been identified as the Windmiller Pattern, first identified on old levee ridges adjacent to freshwater marshes near the confluence of the Mokelumne and Cosumnes rivers. This pattern is represented by extended burials oriented to the west and a sophisticated material culture (Rosenthal et al. 2007). Middle Archaic sites are relatively common in the foothills surrounding the Central Valley and show relatively little change from the Lower Archaic (McGuire 1995).

During this time, the mortar and pestle become more widespread suggesting a shift toward more intensive subsistence practices. Fishing technologies, such as bone gorges, hooks, and spears, also appear during the Middle Archaic suggesting a new focus on fishing. Several other technologies become apparent during this time, particularly in the northern San Joaquin and southern Sacramento Valleys (Rosenthal et al. 2007). Baked-clay impressions of twined basketry, simple pottery, and other baked clay objects have been found at several sites. Personal adornment items also became more frequent. Exchange with outside groups is evidenced by the presence of obsidian, shell beads and ornaments (Rosenthal et al. 2007; Moratto 1984). Trade also seemed to be focused on utilitarian items such as obsidian or finished obsidian tools from at least five separate sources (Moratto 1984).

Upper Archaic (550 B.C. – A.D. 1100)

The Upper Archaic began with the onset of the Late Holocene, marked by a cooler, wetter climate. The Upper Archaic is better represented in the archaeological record than earlier periods. Cultural diversity was more pronounced and is marked by contrasting material cultures throughout the valley (Rosenthal et al. 2007).

During this period, numerous specialized technologies were developed such as bone tools and implements, manufactured goods such as Olivella and Haliotis beads and ornaments, well-made ceremonial blades, and ground-stone plummets. Beginning after circa 2,700 years ago, lower Sacramento Valley settlements shifted to a pattern of large, mounded villages, now identified as the Berkeley Pattern. Berkeley Pattern sites in the Delta region typically contain large amounts of habitation debris and features suggestive of long-term occupation (Rosenthal et al. 2007).

Upper Archaic period economies varied by region throughout the Central Valley. Economies were primarily focused on seasonal resources such as acorns, salmon, shellfish, rabbits, and deer (Rosenthal et al. 2007). In the Sacramento Valley, sites exhibit heavy use of mortars and pestles and a reliance on acorns.

Emergent Occupation (A.D. 1100- Historic)

The stable climatic conditions of the Upper Archaic continued into the Emergent Period. In the Delta Region, this period is associated with the Augustine Pattern (Rosenthal et al. 2007). After A.D. 1000, many of the technologies identified during the Archaic disappeared to be replaced by cultural traditions recorded at European contact. The bow and arrow replaced the atlatl as the preferred hunting method sometime between A.D. 1000 and 1300.

Increased social complexity is evidenced by increased variation in burial types and offerings and larger residential communities. Grave offerings such as shell beads, ornaments, and ritually "killed" mortars and pestles are often found in association with burials. In the Sacramento Valley and Delta regions, diverse and sophisticated fishing technology is often recovered from Emergent Period sites, including various types of harpoons, fishhooks, gorges, and netting (Rosenthal et al. 2007). Pottery was produced at several sites in the lower Sacramento Valley, known as Cosumnes brownware. Baked clay human and animal effigies have also been identified at several sites in the region during this time.

As with the Archaic Period, Emergent Period economies varied geographically, though throughout the Central Valley fishing and plant harvesting increased in importance. Most Emergent residential sites contain diverse faunal assemblages containing mammal and bird remains and large amounts of fish bone. After ca. 1,000 years ago, the mortar and pestle become the dominant tool type and small seeds increase in archaeological deposits over time (Rosenthal et al. 2007).

b. Historical Background

The post-Contact history of California is generally divided into three periods: the Spanish period (1769–1822), the Mexican period (1822–1848), and the American period (1848–present). Each of these periods is briefly described below.

Spanish Period (1769–1822)

In 1542, Juan Rodriguez Cabrillo led the first European expedition to observe what is now called southern California. For more than 200 years, Cabrillo and other Spanish, Portuguese, British, and Russian explorers sailed the Alta (upper) California coast and made limited inland expeditions, but they did not establish permanent settlements (Bean 1968; Rolle 2003).

Gaspar de Portolá and Franciscan Father Junipero Serra established the first Spanish settlement in Alta California at Mission San Diego de Alcalá in 1769. This was the first of 21 missions erected by the Spanish between 1769 and 1823. Portolá continued north, eventually reaching the San Francisco Bay in 1769. In 1772, Pedro Fages led the first Europeans to enter the San Joaquin Valley (Wallace 1978; Johnson et al. 1993). Fages led a small expedition into the southernmost part of the valley, stopping at a village on the shores of Buena Vista Lake, before heading towards San Luis Obispo (Wallace 1978). The next European to enter the valley was Francisco Garcés in 1776 (Wallace 1978). In the early 1800s, numerous expeditions were made into the Central Valley to search for land for new missions or to recapture runaway neophytes (Kyle 2002). However, the Spanish never succeeded in taking control of the region and no missions were established in the Central Valley.

During this period, Spain also deeded ranchos to prominent citizens and soldiers, though very few in comparison to the subsequent Mexican Period. To manage and expand their herds of cattle on these large ranchos, colonists enlisted the labor of the surrounding Native American population (Engelhardt 1927). Very few of the Central Valley tribes came under the control of the Spanish missions or ranchos. However, numerous runaway neophytes fled to the Central Valley, influencing

local populations (Wallace 1978). The increased local population and contact with diseases brought by Europeans greatly reduced the Native American population (McCawley 1996).

Mexican Period (1822–1848)

The Mexican Period commenced when news of the success of the Mexican Revolution (1810-1821) against the Spanish crown reached California in 1822. This period was an era of extensive interior land grant development and exploration by American fur trappers west of the Sierra Nevada Mountains. Beginning in 1833, mission lands were conferred as rancho grants. Governor Pío Pico and his predecessors made more than 600 rancho grants between 1833 and 1846, putting most of the state's lands into private ownership for the first time (Gumprecht 1999). A few ranchos were established in the Sacramento Valley, including Rancho Los Ulpinos just across the Sacramento River from the western terminus of the APE (Kyle 2002). The most successful rancho in the Delta region was owned by John Marsh and located at the foot of Mount Diablo (Bean and Rawls 1983).

The Mexican Period also saw the initial settlement of what was to become the City of Sacramento, with the arrival of John Sutter in 1839 (Bean and Rawls 1983). Sutter established New Helvetia, which was to become a focal point of American settlement in the coming years.

American Period (1848–Present)

The American Period officially began with the signing of the Treaty of Guadalupe Hidalgo in 1848, in which the United States agreed to pay Mexico $15 million for the conquered territory, including California, Nevada, Utah, and parts of Colorado, Arizona, New Mexico, and Wyoming. Settlement of southern California increased dramatically in the early American Period.

The discovery of gold in northern California in 1848 led to the California Gold Rush, though the first California gold was previously discovered in Placerita Canyon near the San Fernando Mission in 1842 (Guinn 1915; Workman 1935:26). Later, in 1848, James Marshall discovered gold while overseeing the construction of Sutter's Mill at Coloma. The discovery of gold led to an explosion in population and to the eventual establishment of the State of California. In 1850, California was admitted into the United States and by 1853, the population of California exceeded 300,000. Thousands of settlers and immigrants continued to move into the state, particularly after the completion of the transcontinental railroad in 1869.

San Joaquin County History and Historic Development

Europeans were active in what is now San Joaquin County by the late 1820s. The Mexican military established a presence in the region by 1829. That year, the Mexican army fought Native American forces that included Estanislao, an escaped indigenous captive, at a fortified site along the Stanislaus River, which was eventually named for Estanislao. After three unsuccessful attempts, a Mexican detachment led by Mariano G. Vallejo took the Native American stronghold, and the indigenous combatants dispersed into the surrounding countryside (Kyle 2002). Further European incursions into the area were made by fur trappers, who likely began hunting what is in the area by the late 1820s. The location of the community of French Camp is situated at a rendezvous spot established by French Canadian hunters in the 1830s and 1840s. The arrival of fur trappers in this era was catastrophic for the indigenous population. Indians residing in the region had little previous contact with Europeans and, as a result, had acquired little immunity to the diseases the colonizers brought with them. By 1833, European observers "reported seeing skulls and bodies under every shade tree" (Kyle 2002).

The earliest permanent European and Euro-American settlements in San Joaquin County predate the California Gold Rush. Charles M. Weber, a German immigrant and eventual founder of Stockton, arrived in Stanislaus County in 1841 as part of the Bidwell-Bartleson expedition. Bidwell initially settled in San Jose and formed a business partnership with blacksmith William Gulnac. In 1842, however, the Weber and Culnac assembled a team of 12 men to settle a colony in what is now French Camp. In 1847, Weber left the colony and founded Stockton, but with the discovery of gold in 1848, briefly left for present El Dorado County to operate a trading company. He soon returned to Stockton and worked to position the town as the area's main shipping point to supply the goldmines. In the 1850s, he influx of gold seekers and the resulting growth of local trade fueled Stockton's growth as the county's main commercial center Kyle 2002).

In the second half of the nineteenth century, the county's population grew sufficiently to feed the expansion of agriculture and industry. As was the case through much of the state, in the 1850s and 1860s, agricultural enterprise flourished in fertile San Joaquin Valley after frustrated miners descended into the San Joaquin Valley to establish farms. Secondary population centers grew to support the agricultural areas, giving birth to such communities as Lockeford (1859) and Lodi (1874). Additional growth centered on railroad development, which began in 1869, when transcontinental service first reached Stockton (Kyle 2002). By the 1890s, Stockton's port and rail access allowed the city to emerge as the principal industrial and transportation hub for the county's agricultural periphery. Around the turn of the twentieth century, a thriving shipbuilding industry first developed along the city's San Joaquin River waterfront (Visit Stockton 2021).

Through the twentieth century, San Joaquin County grew modestly and retained its largely agricultural character. Tracy experienced a population boom in the 1970s as a number of new residents from the San Francisco Bay Area relocated to the city, speeding up its urbanization (Tracy Historical Museum 2021). Stockton remains the county's main urban center, with 291,000 residents accounting for roughly 40 percent of the county's population of 762,000.

c. Known and Potential Historical Resources

Under the California Environmental Quality Act (CEQA), a historical resource is a building, site, structure, object, or district that is eligible for listing or is listed in the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), or a local register due to its historical or archaeological significance. Archaeological historical resource types present, or expected to exist, within the SJCOG region include prehistoric period occupation areas (both short and long term), burial areas, ceremonial areas, resource collection and processing sites, lithic scatters, quarries, rock art sites, trails, and isolated examples of prehistoric period artifacts.

For the historic period, historical resources may include buildings and structures, in addition to trails, roads, railroads, small and large-scale mining features, logging features, occupation areas (short and long term), water conveyance features, quarries, trash dumps, and cemeteries.

In general, prehistoric-period cultural resources were situated in the most favored environmental settings—areas adjacent to permanent water sources with relatively level topography. This is also true of most historic-period built-environment historical resources, with the exception of mining related features and settlements where the discovery of a mineral deposit did not always correspond with a favored environmental setting. It is important to note that lower sensitivity areas could still contain historical resources, and all areas proposed for development should be studied to determine whether potential historical resources are present.

A review of the NRHP and the California Office of Historic Preservation (OHP) web site identified California Historical Landmarks and NHRP- and CRHR-listed properties located in the SJCOG region. NRHP-listed properties are automatically listed in the CRHR. There may be other known and potential historical resources located in the SJCOG region. Resources identified on the OHP web site are listed in Table 4.4-1. A review of the OHP Built Environment Resource Directory identified more than 2,300 known and potential historical resources that have been listed in, determined eligible for, or recommended eligible for listing in the NRHP, CRHR, or a local register. The Caltrans Historic Bridge Inventory identifies one local agency bridge in the SJCOG region that has been determined eligible for the NRHP, Mormon Slough Bridge (Bridge Number 29C0232), which carries South Sutter Street over Mormon Slough in Stockton. The historical significance of some local agency bridges in the SJCOG region have not been determined, and some may possess historical significance that would qualify them as historical resources. The Caltrans inventory of historic state agency bridges identified 4 bridges that are eligible for listing in the NRHP: the W120-S5 Connector (Bridge Number 29 0016F), carrying the State Route 120-Interstate 5 connector over the San Joaquin River; Mokelumne River Bridge (Bridge Number 29 0043), which carries State Route 12 over the Mokelumne River; the Old River Bridge (Bridge Number 29 0045), carrying State Route 4 over the Old River; and the Middle River Bridge (29 0049) carrying State Route 4 over the Middle River.

Table 4.4-1 SJCOG Region Historical Resources[1]

Reference Number	Location	Resource Name	Address and/or Date Listed
California Historical Landmarks[2]			
149	Thornton	Benson's Ferry	South bank of North Fork Mokelumne River, 100 feet west of County Road J8
155	Clements	Lone Star Mill	Entrance to Stillman L. Magee Park, Mackville Road
162	Thornton	Site of Mokelumne City	200 feet north of intersection of Cameron Road and Thornton Road
163	Woodbridge	Site of Wood's Ferry and Wood's Bridge	Present bridge is at the approximate location of the original ferry and bridge, County Highway Jl0
165	Stockton	Weber Point	Center Street between Channel and Miner streets
178	Stockton	Site of first building in present city of Stockton	City Hall, on Civic Street between Miner and El Dorado streets
214	N/A	Site of battle between forces under General Vallejo and San Joaquin Valley Indians	200 yards southeast of the confluence of the San Joaquin and Stanislaus rivers on the north bank of Stanislaus River
358	Woodbridge	Town of Woodbridge	On County Highway Jl0
365	Lockeford	Lockeford (Loke's Ford)	0.6 mi north on Elliotte Road
436	Ripon	New Hope	Ripon City Park, Fourth and Locust streets
437	Tracy	First landing place of the sailing launch *Comet*	Plaque located at the entrance to Mossdale Crossing Park and Ramp
513	Stockton	Burial place of John Brown (Juan Falco)	1100 East Weber Street
520	Woodbridge	San Joaquin Valley College	18500 North Lilac Street
668	French Camp	French Camp	Elm Street at French Camp School
740	Tracy	Carnegie	Carnegie State Vehicular Recreation Area, 5.9 miles west of I-580 on Corral Hollow Road
755	Tracy	Corral Hollow	1.5 miles west of I-580 on Corral Hollow Road

Reference Number	Location	Resource Name	Address and/or Date Listed
765	Stockton	Temple Israel Cemetery	East Acacia Street between North Pilgrim and North Union streets
777	Tracy	Site of San Joaquin City	1.4 mi north of the San Joaquin County line on County Highway J3
780	Tracy	First Transcontinental Railroad—site of completion of the Pacific Railroad	Plaque located at the entrance to Mossdale Crossing Park and Ramp
801	Stockton	Reuel Colt Gridley Monument	Stockton Rural Cemetery near Memory Chapel
931	Lodi	Lodi Arch	Southeast corner of East Pine and South Sacramento streets
934	Stockton	Temporary detention camps for Japanese Americans-Stockton Assembly Center	Administration Building, San Joaquin County Fairgrounds, Airport Way
935	French Camp	California Chicory Works	1672 West Bowman Road
995	N/A	Trail of the John C. Frémont 1844 Expedition	Northwest corner of junction of Highway 88 and the Calaveras River
1016	Stockton	Stockton Developmental Center	510 E Magnolia Street
1039	Stockton	Sikh Temple Site	1930 South Grant Street
National Register of Historic Places			
N2357	Clements	I.O.O.F. Lodge #355	Harding Way and Pacific Ave.
N/A	Lockeford	Harmony Grove Church	42 N. Sutter St.
N178	Lockeford	Locke House and Barn	11 S. San Joaquin St.
N1039	Lockeford	Locke's Meat Market	242 E. Main St.
N/A	Lodi	Hotel Lodi	345 W. Clay St.
N902	Lodi	Lodi Arch	548 Park St.
N1454	Lodi	Morse–Skinner Ranch House	133 E. Weber Ave.
N1281	Lodi	Terminous Culling Chute	25 S. Commerce St.
N715	Lodi	Woman's Club of Lodi	55 W. Flora St.
N1561	Stockton	Cole's Five Cypress Farm	1000 N. Hunter St.
N931	Stockton	Commercial and Savings Bank	921 S. San Joaquin St.
N510	Stockton	El Dorado Elementary School	146 W. Weber Ave.
N868	Stockton	Elks Building	445 W. Weber
N907	Stockton	Farmer's and Merchant's Bank	301 E. Main St.
N789	Stockton	Fox California Theater	229 E. Weber St.
N672	Stockton	Gew, Wong K., Mansion	401 N. San Joaquin St.
N1052	Stockton	Holt, Benjamin, House	628 Central Ave.
N950	Stockton	Hotel Stockton	801 Central Ave.
N667	Stockton	Nippon Hospital	31524 S. Kasson Rd.
N251	Stockton	Old Weber School	25 W. 7th St.
N/A	Stockton	Philomathean Clubhouse	24 W. 11th St.
N594	Stockton	Rodgers, Moses, House	47 W. 6th St.
N1040	Stockton	Sperry Office Building	Main St.

Reference Number	Location	Resource Name	Address and/or Date Listed
N747	Stockton	Sperry Union Flour Mill	1040 Augusta St.
N681	Stockton	Stockton Savings and Loan Society Bank	18819 East CA 88
N1152	Stockton	Tretheway Block	11455 E Locke Rd
N1175	Stockton	U.S. Post Office	19960 W. Elliott Rd.
N1364	Tracy	Bank of Italy	13480 CA 88
N867	Tracy	Bank of Tracy	5 S. School St.
N1022	Tracy	Ohm, John, House	Pine St.
N824	Tracy	Tracy City Hall and Jail	13063 N. CA 99
N919	Tracy	Tracy Inn	14900 W. CA 12
N715	Tracy	West Side Bank	325 W. Pine St.
N1095	Woodbridge	I.O.O.F. Hall	11221 E. Eight Mile Rd.
N1593	Woodbridge	Woodbridge Masonic Lodge No. 131	343 Main St.
C25	Ripon	Markham Hotel[3]	N/A
C24	Stockton	Oak Lawn/Shippee Home Ranch[3]	N/A
C19	Stockton	Western Pacific Railway Depot[3]	1025 East Main Street

Sources: California Office of Historic Preservation, 2021; NRHP 2021

1. This list may not include all historical resources listed on the NRHP and CRHR.

2. California Historical Landmarks 1-769 and Points of Historical Interest designated prior to January 1998 need to be reevaluated using current standards.

3. Resource is listed in the CRHR but not in the NRHP.

4.4.2 Regulatory Setting

This section includes a discussion of the applicable laws, ordinances, regulations, and standards governing cultural resources.

a. Federal Laws, Regulations, and Policies

National Register of Historic Places

The National Register of Historic Places (NRHP) was established by the National Historic Preservation Act of 1966 as "an authoritative guide to be used by Federal, state, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 Code of Federal Regulations 60.2). The NRHP recognizes properties that are significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. A property is eligible for the NRHP if it meets any one of the following criteria:

- **Criterion A:** Are associated with events that have made a significant contribution to the broad patterns of our history

- **Criterion B:** Are associated with the lives of persons significant in our past
- **Criterion C:** Embody the distinctive characteristics of a type, period, or method of installation, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction
- **Criterion D:** Have yielded, or may be likely to yield, information important in prehistory or history

In addition to meeting at least one of the above designation criteria, resources must also retain integrity. The National Park Service recognizes seven aspects or qualities that, considered together, define historic integrity. To retain integrity, a property must possess several, if not all, of these seven qualities, defined in the following manner:

- **Location:** The place where the historic property was constructed or the place where the historic event occurred
- **Design:** The combination of elements that create the form, plan, space, structure, and style of a property
- **Setting:** The physical environment of a historic property
- **Materials:** Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property
- **Workmanship:** The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory
- **Feeling:** A property's expression of the aesthetic or historic sense of a particular period of time
- **Association:** The direct link between an important historic event or person and a historic property

The Department of Transportation Act

Passed in 1966, the Department of Transportation Act (49 United States Code 303, formerly 49 United States Code 1651(b)(2) and 49 United States Code 1653f) includes Section 4(f), which states that the Federal Highway Administration and other U.S. Department of Transportation agencies cannot approve the use of land from public and private historical sites unless certain conditions apply. These conditions are the following: If there is no feasible and prudent avoidance alternative to the use of land, and if the action includes all possible planning to minimize harm to the property resulting from such use; or if the Federal Highway Administration determines the use of the property will have a *de minimis* impact.

Archaeological Resources Protection Act of 1979 (ARPA)

This regulation was enacted to protect archaeological resources and sites that are on public lands and tribal lands, to foster increased cooperation and exchange of information between government representatives, the professional archaeological community, and private individuals. Section 4 of the statute and Sections 16.5-16.12 of the uniform regulations describe the requirements that must be met before federal authorities can issue a permit to excavate or remove any archaeological resource on federal or tribal lands. The curation requirements of artifacts, other materials excavated or removed, and the records related to the artifacts and materials are described in Section 5 of the ARPA. This section also authorizes the Secretary of the Interior to issue regulations describing in more detail the requirements regarding these collections.

b. State Laws, Regulations, and Policies

California Register of Historical Resources

The CRHR program was designed for use by state and local agencies, private groups, and citizens to identify, evaluate, register, and protect California's historical resources. A historical resource can include any object, building, structure, site, area, or place that is determined to be historically or archaeologically significant. The CRHR is an authoritative guide to the state's significant archaeological and historic architectural resources. The list of these resources can be used for state and local planning purposes, the eligibility determinations can be used for state historic preservation grant funding and listing in the CRHR provides a certain measure of protection under CEQA.

California Historical Landmarks Program

The Historical Landmarks Program was instated to register buildings or landmarks of historical interest. Historical Landmarks are defined as sites, buildings, or features that have a statewide historical, cultural, anthropological, or other significance. To be designated as a Historical Landmark by the Director of California State Parks, the resource must meet set criteria, be recommended for designation by the State Historical Resources Commission and be approved by the property owners. The goals of the program include the preservation and maintenance of registered landmarks, most of which include missions, early settlements, battles, and gold rush sites (PRC Sections 5020.4, 5021, 5022, 5022.5, 5031 and 5032).

California Environmental Quality Act

Archaeological Resources

CEQA requires lead agencies to consider whether projects would affect unique archaeological resources. PRC Section 21083.2(g) states that "unique archaeological resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions. And there is a demonstrable public interest in that information
2. Has a special and particular quality, such as being the oldest of its type or the best available example of its type
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person

Impacts to Historical Resources

Section 15064.5 of the *State CEQA Guidelines* states that "a project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment." The *State CEQA Guidelines* (Section 15064.5(a)) define an "historical resource" as including the following:

- A resource listed in, or eligible for listing in, the California Register of Historical Resources
- A resource listed in a local register of historical resources (as defined at PRC Section 5020.1(k)

- A resource identified as significant in a historical resources survey meeting the requirements of PRC Section 5024.1(g)

Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. (Generally, a resource is considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the CRHR.

State CEQA Guidelines (Section 15064.5(b)[1]) define "substantial adverse change" as "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired." Generally, the significance of a historical resource is "materially impaired" when a project demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its inclusion in or eligibility for the CRHR, or its inclusion in a local register of historical resources (State CEQA Guidelines Section 15064.5(b)(2)).

Standard Mitigation Measures Under CEQA

HISTORICAL RESOURCES

Mitigation measures for historical resources impacts are discussed in State CEQA Guidelines Section 15126.4. Generally, by following the Secretary of the Interior's Standards for the Treatment of Historic Properties or the Secretary of the Interior's Standards for Rehabilitation, impacts can be considered as mitigated to a level less than significant. For historical resources that are archaeological sites, according to the State CEQA Guidelines Section 15126.4(b)(3), public agencies should, whenever feasible, seek to avoid damaging effects on any historical resource of an archaeological nature.

UNIQUE ARCHEOLOGICAL RESOURCES

A cultural resource is also significant if it is a unique *archaeological resource*, which is defined in §21083.2(g) as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person

If an archaeological resource qualifies as a "historical resource," potential adverse impacts must be considered in the same manner as a historical resource *State CEQA Guidelines* Section 15064.5(c)(2)). If the archaeological site does not qualify as a historical resource but does qualify as a unique archaeological resource, then the archaeological site is treated in accordance with PRC Section 21083.2 (State CEQA Guidelines Section 15064.5(c)(3)).

California Public Resources Code Section 5024 and State-Owned Lands

Historical resources on State-owned lands are subject to the requirements of PRC Section 5024. PRC Section 5024.5(f) requires State agencies to submit to SHPO for comment documentation for any project having the potential to affect historical resources under its jurisdiction listed in or potentially eligible for inclusion in the NRHP or registered or eligible for registration as California Historical Landmarks. The SHPO has 30 days after receipt of the notice for review and comment. If the SHPO determines that a proposed action would have an adverse effect on a listed historical resource, the relevant State agency shall adopt prudent and feasible measures that will eliminate or mitigate the adverse effects.

California Native American Historical, Cultural, and Sacred Sites Act

The California Native American Historical, Cultural, and Sacred Sites Act (PRC Section 5097.9) applies to both State and private lands. The act requires, upon discovery of human remains, that construction or excavation activity cease and that the County Coroner be notified. If the remains are those of a Native American, the coroner must notify the NAHC, which notifies and has the authority to designate the most likely descendant (MLD) of the deceased. The act stipulates the procedures that the descendants may follow for treating or disposing of the remains and associated grave goods.

Health and Safety Code Section 7050.5

Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If they are determined to be Native American, the coroner must contact the NAHC.

Public Resources Code Section 5097

PRC Section 5097 specifies the procedures to be followed in the event of the unexpected discovery of human remains on nonfederal land. The disposition of Native American burial falls within the jurisdiction of the NAHC. Section 5097.5 of the PRC states the following:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

California Health and Safety Code Sections 7050.5, 7051, and 7054

HSC Sections 7050.5, 70051, and 7051, and 7054 specify the provisions for the protection of human burial remains. Section 7050.5 of the HSC states the following:

> In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with Section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of Section 27491 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner and

cause of any death, and the recommendations concerning the treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the Public Resources Code. The coroner shall make his or her determination within two working days from the time the person responsible for the excavation, or his or her authorized representative, notifies the coroner of the discovery or recognition of the human remains. If the coroner determines that the remains are not subject to his or her authority and if the coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission.

Section 7051 of the HSC states the following:

> Every person who removes any part of any human remains from any place where it has been interred, or from any place where it is deposited while awaiting interment, cremation, or hydrolysis, with intent to sell it or to dissect it, without authority of law, or written permission of the person or persons having the right to control the remains under Section 7100, or with malice or wantonness, has committed a public offense that is punishable by imprisonment pursuant to subdivision (h) of Section 1170 of the Penal Code.

Section 7054 of the HSC states the following:

(a) (1) Except as authorized pursuant to the sections referred to in subdivision (b), every person who deposits or disposes of any human remains in any place, except in a cemetery, is guilty of a misdemeanor.

(2) Every licensee or registrant pursuant to Chapter 12 (commencing with Section 7600) of Division 3 of the Business and Professions Code and the agents and employees of the licensee or registrant, or any unlicensed person acting in a capacity in which a license from the Cemetery and Funeral Bureau is required, who, except as authorized pursuant to the sections referred to in subdivision (b), deposits or disposes of any human remains in any place, except in a cemetery, is guilty of a misdemeanor that shall be punishable by imprisonment in a county jail not exceeding one year, by a fine not exceeding ten thousand dollars ($10,000), or both that imprisonment and fine.

(b) Cremated remains or hydrolyzed human remains may be disposed of pursuant to Sections 7054.6, 7116, 7117, and 103060.

(c) Subdivision (a) of this section shall not apply to the reburial of Native American remains under an agreement developed pursuant to subdivision (l) of Section 5097.94 of the Public Resources Code, or implementation of a recommendation or agreement made pursuant to Section 5097.98 of the Public Resources Code.

Public Resources Code Section 5097.98

PRC Section 5097.98 addresses the disposition of Native American burials, protects such remains, and established the NAHC to resolve any related disputes. Section 5097.98 of the PRC states the following:

(a) Whenever the commission receives notification of a discovery of Native American human remains from a county coroner pursuant to subdivision (c) of Section 7050.5 of the Health and Safety Code, it shall immediately notify those persons it believes to be most likely descended from the deceased Native American. The descendants may, with the permission

of the owner of the land, or his or her authorized representative, inspect the site of the discovery of the Native American human remains and may recommend to the owner or the person responsible for the excavation work means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods. The descendants shall complete their inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site.

(b) Upon the discovery of Native American remains, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located, is not damaged or disturbed by further development activity until the landowner has discussed and conferred, as prescribed in this section, with the most likely descendants regarding their recommendations, if applicable, taking into account the possibility of multiple human remains. The landowner shall discuss and confer with the descendants all reasonable options regarding the descendants' preferences for treatment.

California Native American Graves Protection and Repatriation Act

Health and Safety Code Sections 8010–8011 establishes a State repatriation policy intent that is consistent with and facilitates implementation of the federal Native American Graves Protection and Repatriation Act. The act strives to ensure that all California Indian human remains and that cultural and cultural items by publicly funded agencies and museums in California. It also states the intent for the State to provide mechanisms for aiding California Indian tribes, including non-federally recognized tribes, in filing repatriation claims and getting responses to those claims.

California Health and Safety Code Sections 18950 through 18961

The State Historic Building Code (HSC; Sections 18950–18961) provide alternative building regulations and building standards for the rehabilitation, preservation, restoration (including related reconstruction), or relocation of buildings or structures designated as historic buildings. Such alternative building standards and building regulations are intended to facilitate the restoration or change of occupancy to preserve their original or restored architectural elements and features, to encourage energy conservation and a cost-effective approach to preservation, and to provide for the safety of the building occupants.

c. Regional and Local Laws, Regulations, and Policies

San Joaquin County General Plan 2035

Part 3.4 of the San Joaquin County General Plan, adopted in December 2016, consists of a Natural and Cultural Resources Element that outlines the County's goals and policies for how it will ensure that development occurs in a manner that limits impacts to natural and cultural resources. Goal NCR-6 specifically addresses Cultural and Historic Resources, stating that the focus of the goal section is to "identify ways to protect, preserve, and enhance the valuable cultural and historic resources that are vital to the character of the County."

Goal NCR-6

To protect San Joaquin County's valuable architectural, historical, archaeological, and cultural resources.

- NCR-6.1 Protect Historical and Cultural Resources

The County shall protect historical and cultural resources and promote expanded cultural opportunities for residents to enhance the region's quality of life and economy.

- NCR-6.2 No Destruction of Resources

The County shall ensure that no significant architectural, historical, archeological, or cultural resources are knowingly destroyed through County action.

- NCR-6.3 Encourage Public and Private Preservation Efforts

The County shall continue to encourage efforts, both public and private, to preserve the historical and cultural heritage of San Joaquin County and its communities and residents.

- NCR-6.4 Registration of Historic Properties

The County shall encourage owners of eligible historic properties to apply for State and Federal registration, to participate in tax incentive programs for historical restoration, and to enter into Mills Act Contracts.

- NCR-6.5 Protect Archeological and Historical Resources

The County shall protect significant archeological and historical resources by requiring an archeological report be prepared by a qualified cultural resource specialist prior to the issuance of any discretionary permit or approval in areas determined to contain significant historic or prehistoric archeological artifacts that could be disturbed by project construction.

- NCR-6.6 Tribal Consultation

The County shall consult with Native American tribes regarding proposed development projects and land use policy changes consistent with the State's Local and Tribal Intergovernmental Consultation requirements.

- NCR-6.7 Adaptive Reuse of Historic Structures

The County shall encourage the adaptive reuse of architecturally significant or historic buildings if the original use of the structure is no longer feasible and the new use is allowed by the underlying land use designation and zoning district.

- NCR-6.8 Land Use and Development

The County shall encourage land uses and development that retain and enhance significant historic properties and sustain historical community character.

NCR-6.9 Educational Programs

The County shall support educational and outreach programs that promote public awareness of and support preservation of historical and cultural resources.

San Joaquin County Historic Resource Preservation Ordinance

Chapter 9-1053 of the San Joaquin County Code is the County's pertains to historic preservation. The intent of the chapter is to establish regulations for the preservation of historic resources, such

as cultural, archaeological, architectural, aesthetic, and environmental resources, within San Joaquin County. The ordinance does not identify procedures or criteria for the designation of historic resources. However, the ordinance requires the issuance of a use permit shall be required prior to any change in the use of an historical resource.

City General Plans and Regulations

City of Escalon General Plan

Adopted in 2005, the City of Escalon General Plan Community Design Element of the General Plan contains policies intended to preserve and improve the quality of life in Escalon by addressing, among other issues, the preservation and enhancement of the historical character of the community. In addition, Chapter 17.31 of the City of Escalon Municipal Code regulates the designation of Historic or H Overlay Districts and Landmarks to ensure the protection, enhancement, perpetuation, and use of structures and districts of historical and architectural significance located within the city for the cultural, and aesthetic benefit to the community and the enhancement of the economic, cultural, and aesthetic standing of the city. An individual property or o a collection of properties may be designated historical if they meet certain criteria identified in the ordinance.

City of Lathrop General Plan

The City of Lathrop General Plan Resource Management Element includes two policies pertaining to the preservation of archaeological and built-environment historical resources. The first of these promotes the protection of known Native American archaeological sites, proposing adherence to CEQA guidance regarding confidentiality, the development of project design alternatives, and consultation with Native American tribes. The other policy proposes certain requirements to ensure that development activities avoid impacts to unknown archaeological resources.

City of Lodi General Plan

The General Plan's Conservation Element outlines seven policies intended to preserve, archaeological and built-environment cultural resources. Policies related to the protection of archaeological resources include specific requirements related to the conduct of background research and field surveys, best practices in the case of the inadvertent discovery of archaeological discoveries, procedures to follow if human remains are found. Policies relevant to built-environment resources require efforts to relocate historically significant buildings proposed for demolition, prepare adequate environmental review prior to the issuance of permits, coordinate with local historical societies, and, where applicable, adhere to current Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings.

City of Manteca General Plan 2023

The City of Manteca General Plan 2023 Resource Conservation and Economic Development Elements include goals, policies, and implementation measures pertaining to the preservation of the city's archaeological and built-environment cultural resources. To preserve and enhance the City's archaeological and historic resources and protect its Native American heritage, the Conservation Element establishes standards for the conduct of research and site evaluation and design of impact mitigation for development projects that may affect archaeological sites. The Economic

Development Element proposes that the community's historic structures shall be preserved where feasible.

City of Ripon General Plan

The City of Ripon General Plan's Open Space and Conservation Element includes goals and policies intended to prevent the knowing demolition of archaeological and built-environment historical resources. In addition, Ripon has a Historic Overlay Districts ordinance (Chapter 16.44), which was enacted to promote the preservation of historical resources in the city. Under the ordinance, a building, site, natural feature or part of the city may be designated as a landmark if it meets certain criteria. Certain limits are placed on projects that propose to alter or demolish a designated property.

City of Stockton General Plan

the Stockton 2040 General Plan's, Land Use Element. and the Land Use Element contains goals, policies, and actions intended to promote the preservation of archaeological and built-environment historical resources. These include provisions to preserve the character of neighborhoods and historic districts and establish requirements for the preparation of cultural resources field reports, site studies, Native American consultation, and implementation of measures to mitigate effects to cultural resources. In addition, Chapter 16.220 of the City of Stockton Municipal Code provides regulations for the preservation of the city's cultural resources. Under the ordinance, a qualifying resource may be designated under one of four categories: Landmark, Historic Preservation District, Historic Site, and Structure of Merit.

City of Tracy General Plan

The City of Tracy General Plan's Community Character Element outlines policies to preserve and enhance Tracy's character, while incorporating new growth and development. The Community Character Element provides several goals, objectives, policies and actions applicable to archaeological and built-environment historical resources. These provisions pertain to, among other things, the identification and protection of archaeological and built environment historical resources, specifically in downtown Tracy, where preservation, restoration, rehabilitation, reuse and maintenance of existing Downtown buildings is encouraged.

4.4.3 Impact Analysis

a. Methodology and Significance Thresholds

For this discussion, the term historical resource broadly includes archaeological and built-environment resources that are eligible for inclusion in the NRHP, CRHR, or a local historic register. The significance of a historical resource impact is determined by whether or not that resource meets the criteria discussed below. Where the significance of a site is unknown, it is presumed to be a significant resource for the purpose of identifying potential areas of disturbance associated with construction projects or development in urban infill areas near high-quality transportation corridors as outlined in the 2022 RTP/SCS.

Based on CEQA Guidelines Section 15064.5, future reasonably anticipated development activities carried out under the 2022 RTP/SCS would have a significant impact on historical resources if they would cause a substantial adverse change in the significance of a historical resource. Historical

resources may include buildings, structures and objects over 45 years of age that have been listed in, or found eligible for, the NRHP, CRHR, or a local register. CEQA and local regulations do not specify an age threshold for historical resources. However, guidance from the State of California OHP recommends that "sufficient time" – typically 50 years – "must have passed to obtain a scholarly perspective" necessary to evaluate the significance of the historical events with which a property is associated.[1] A threshold of 45 years is recommended because it is recognized that there is often "a five year lag between resource identification and the date that planning decisions are made."[2] As explained in Section 15064.5, "[s]ubstantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" so that it would no longer convey its significant historical associations.

Appendix G of the State CEQA Guidelines identifies the following criteria for determining whether development facilitated by the proposed 2022 RTP/SCS would have a significant impact on cultural and historic resources, namely an analysis of whether or not the 2022 RTP/SCS would:

1. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5.
2. Cause a substantial adverse change in the significant of an archaeological resource pursuant to §15064.5.
3. Disturb any human remains, including those interred outside of formal cemeteries.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with projects contained within the 2022 RTP/SCS. Section 4.4.3.c summarizes the impacts associated with capital improvement projects proposed in the 2022 RTP/SCS. Due to the programmatic nature of 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1:	Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5

Impact CR-1 TRANSPORTATION IMPROVEMENT PROJECTS AND THE LAND USE SCENARIO ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD CAUSE A SUBSTANTIAL ADVERSE CHANGE IN THE SIGNIFICANCE OF A HISTORICAL RESOURCE PURSUANT TO §15064.5. THIS IMPACT WOULD BE SIGNIFICANT AND UNAVOIDABLE.

As shown in Table 4.4-1, there are 9 California State Historic Landmarks and 38 properties listed on NRHP and/or the CRHR located throughout the SJCOG region which currently qualify as historical resources. There are more than 2,300 known historical resources listed in or eligible for the NRHP, CRHR, or local registers located throughout the SJCOG region. There may be other yet unidentified

[1] State of California. Department of Parks and Recreation. Office of Historic Preservation, "California Office of Historic Preservation Technical Assistance Series #6, California Register and National Register: A Comparison (for purposes of determining eligibility for the California Register)." https://ohp.parks.ca.gov/pages/1069/files/technical%20assistance%20bulletin%206%202011%20update.pdf,. Accessed December 14, 2020.
[2] State of California. Department of Parks and Recreation. Office of Historic Preservation. "Instructions for Recording Historical Resources," March 1995. https://scic.sdsu.edu/_resources/docs/manual95.pdf. Accessed December 14, 2020.

historical resources eligible for inclusion in the NRHP, CRHR, or a local register pending further analysis.

Due to the programmatic nature of the 2022 RTP/SCS, known and potential historical resources may be encountered as a result of implementation of transportation improvement projects pursuant to the 2022 RTP/SCS. Projects proposed under the 2022 RTP/SCS include, but are not limited to, the construction of new roads; widening of existing highways and arterials with the construction of new motor vehicle and bicycle lanes, reconstruction of interchanges; installation of new bus stop shelters; and improvements to rail and other transit facilities. If projects would involve the modification or demolition of existing buildings or structures, it is possible that such buildings or structures could be known or potential historical resources (as determined by site-specific evaluation), given the presence of structures that are over 45 years of age throughout the SJCOG region, particularly within existing urbanized areas. A proposed project which resulted in the demolition or adverse modification of a qualifying historical resource, the project would have the potential to materially impair the resource and result in a significant impact on the environment pursuant to Section 16064.5(b) of the CEQA Guidelines.

County- and city-sponsored projects would be subject to local ordinance requirements, including General Plan provisions, that protect cultural resources. Nevertheless, impacts would be significant because there could be substantial adverse changes to historic structures and buildings that meet the definition of "historical resources." The following mitigation would be required for any project that may impact built environment historical resources.

Mitigation Measure

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measure for applicable transportation projects that would result in cultural resource impacts, and where feasible and necessary based on site-specific considerations. San Joaquin County and incorporated cities in the County should implement these measures where relevant to land use projects implementing the 2022 RTP/SCS. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions.

CR-1 Built Environment Historical Resources Impact Minimization

Prior to individual project permit issuance, the implementing agency of a 2022 RTP/SCS project involving a building or structure over 45 years of age shall prepare a map defining the project area. This map shall indicate the areas of disturbance associated with construction and operation of the facility and will help in determining whether known and potential historical resources are located within the project area. If a structure greater than 45 years in age is within the identified impact zone, a survey and evaluation of the structure(s) to determine their eligibility for recognition under State, federal, or local historic resource designation criteria shall be conducted. The evaluation shall be prepared by an architectural historian or historical architect meeting the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, Professional Qualification Standards (PQS) as defined in 36 CFR Part 61. All buildings and structures 45 years of age or older within the project area shall be evaluated in their historic context and documented in a report meeting the State Office of Historic Preservation guidelines. All evaluated properties shall be documented on Department of Parks and Recreation Series 523 Forms. The report shall be submitted to the implementing agency for review and concurrence.

If historical resources are identified within the project area of a proposed development, efforts shall be made to the extent feasible to ensure that impacts are mitigated. Application of mitigation shall generally be overseen by a qualified architectural historian or historic architect meeting the PQS, unless unnecessary in the circumstances (e.g., preservation in place). In conjunction with any development application that may affect the historical resource, a report identifying and specifying the treatment of character-defining features and construction activities shall be provided to the implementing agency for review.

To the greatest extent possible the relocation, rehabilitation, or alteration of the resource shall be consistent with the *Secretary of the Interior's Standards for the Treatments of Historic Properties* (Standards). In accordance with CEQA, a project that has been determined to conform with the Standards generally would not cause a significant adverse direct or indirect impact to historical resources (14 CCR § 15126.4[b)(][1]). Application of the Standards shall be overseen by a qualified architectural historian or historic architect meeting the PQS. In conjunction with any development application that may affect the historical resource, a report identifying and specifying the treatment of character-defining features and construction activities shall be provided to the implementing agency for review and concurrence.

If significant historical resources are identified on a development site and compliance with the Standards and/or avoidance is not possible, appropriate site-specific mitigation measures shall be established and undertaken. Mitigation measures may include documentation of the historical resource in the form of a Historic American Building Survey-Like report. The report shall comply with the Secretary of the Interior's Standards for Architectural and Engineering Documentation and shall generally follow the HABS Level III requirements, including digital photographic recordation, detailed historic narrative report, and compilation of historic research. The documentation shall be completed by a qualified architectural historian or historian who meets the PQS and submitted to the implementing agency prior to issuance of any permits for demolition or alteration of the historical resource. Copies of the report shall be provided to a local library and/or other appropriate repositories.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate.

Significance After Mitigation

Redevelopment or demolition that may be required to implement transportation improvements and related development may result in the permanent loss or damage to historic structures. Although implementation of Mitigation Measure CR-1 would reduce impacts to the extent feasible, some project-specific impacts would result in the demolition or other impairments of a historical resource's historical significance. Therefore, this impact is significant and unavoidable. No additional mitigation measures to reduce this impact to less-than-significant levels are feasible.

Threshold 2:	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5

Impact CR-2 CONSTRUCTION ACTIVITY ASSOCIATED WITH PROPOSED TRANSPORTATION IMPROVEMENT PROJECTS AND THE LAND USE SCENARIO ENVISIONED BY THE PROPOSED 2022 RTP/SCS MAY CAUSE A SUBSTANTIAL ADVERSE CHANGE IN THE SIGNIFICANCE OF AN ARCHAEOLOGICAL RESOURCE PURSUANT TO §15064.5. POTENTIAL IMPACTS TO ARCHAEOLOGICAL RESOURCES WOULD BE SIGNIFICANT AND UNAVOIDABLE.

It is known that archaeological resources are present throughout the SJCOG region. Therefore, it is possible to encounter known and unknown archaeological resources as a result of implementation of transportation improvement projects pursuant to the 2022 RTP/SCS. Many of the improvements proposed under the 2022 RTP/SCS consist of minor expansions of existing facilities that would not involve construction in previously undisturbed areas. However, depending on the location and extent of the proposed improvement and ground disturbance, known and/or unknown cultural resources could be impacted. Project-specific analysis would be required as individual projects are proposed.

Representative new projects in the 2022 RTP/SCS that may disrupt previously undisturbed areas are listed in Table 2-1 of Section 2, *Project Description*. The projects listed in this table were chosen based on potential to include new infrastructure. It is possible that some of the proposed roadway or bridge widening or extension projects, beyond those listed in Table 2-1 of Section 2, *Project Description*, would adversely impact archaeological resources. In particular, construction activities may disturb the resources thereby exposing them to potential vandalism or causing them to be displaced from the original context and integrity. Project specific analysis will be required as these individual projects are proposed.

The 2022 RTP/SCS considers a future land use scenario that emphasizes infill near transit and in existing urbanized areas, but also includes development in less urbanized areas. However, it is possible that archaeological resources could be located on or near future infill development sites, and in undisturbed areas that would be developed during implementation of the 2022 RTP/SCS. Project grading and excavation for development sites would disturb these known or undiscovered resources.

In general, prior to commencement of any action, development or land use changes on lands subject to federal jurisdiction or for projects involving federal funding, a cultural resource survey and an environmental analysis must be prepared. County and city sponsored projects would be subject to local ordinance requirements, including General Plan provisions that protect cultural resources. Nevertheless, impacts to archaeological resources would be potentially significant because there could be substantial adverse changes to significant archaeological resources, i.e., archaeological resources that meet the definition of “historical resources” or “unique archaeological resources.”

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures for applicable transportation projects that would result in cultural resource impacts, and where feasible and necessary based on site-specific considerations. San Joaquin County and incorporated cities in the County should implement these measures where relevant to land use projects implementing the

2022 RTP/SCS. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions.

CR-2(a) Archaeological Resources Impact Minimization

Before construction activities, implementing agencies shall retain a qualified archaeologist to conduct a record search at the Central California Information Center to determine whether the project area has been previously surveyed and whether resources were identified. When recommended by the Information Center, implementing agencies shall retain a qualified archaeologist to conduct archaeological surveys before construction activities. Implementing agencies shall, or can and should, follow recommendations identified in the survey, which may include, but would not be limited to: subsurface testing, designing and implementing a Worker Environmental Awareness Program (WEAP), construction monitoring by a qualified archaeologist, or avoidance of sites and preservation in place, and/or data recovery if avoidance is not feasible. Recommended mitigation measures shall be consistent with CEQA Guidelines Section 15126.4(b)(3) recommendations and may include but not be limited to preservation in place and/or data recovery. All cultural resources work shall follow accepted professional standards in recording any find including submittal of standard DPR Primary Record forms (Form DPR 523) and location information to the appropriate California Historical Resources Information System office for the project area.

CR-2(b) Unanticipated Discoveries During Construction

During construction activities, implementing agencies shall, or can and should, implement the following measures. If evidence of any prehistoric or historic-era subsurface archaeological features, deposits or tribal cultural resources are discovered during construction-related earthmoving activities (e.g., ceramic shard, trash scatters, lithic scatters), all ground-disturbing activity proximate to the discovery shall be halted until a qualified archaeologist (36 CFR Section 61) can assess the significance of the find. If the find is a prehistoric archaeological site, the appropriate Native American group shall be notified. If the archaeologist determines that the find does not meet the CRHR standards of significance for cultural resources, construction may proceed. If the archaeologist determines that further information is needed to evaluate significance, a testing plan shall be prepared and implemented. If the find is determined to be significant by the qualified archaeologist (i.e., because the find is determined to constitute either an historical resource or a unique archaeological resource), the archaeologist shall work with the implementing agency to avoid disturbance to the resources, and if complete avoidance is not feasible in light of project design, economics, logistics and other factors, shall recommend additional measures such as the preparation and implementation of a data recovery plan. All cultural resources work shall follow accepted professional standards in recording any find including submittal of standard DPR Primary Record forms (Form DPR 523) and location information to the appropriate California Historical Resources Information System office for the project area. If the find is a prehistoric archaeological site, the culturally affiliated California Native American tribe shall be notified and afforded the opportunity to monitor mitigative treatment. During evaluation or mitigative treatment, ground disturbance and construction work could continue in other parts of the project area that are distant enough from the find not to impact it, as determined by the qualified archaeologist.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. These mitigation

measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate.

Significance After Mitigation

Implementation of Mitigation Measures CR-2(a) and CR-2(b) would reduce potential impacts to archaeological resources to the extent feasible, but some project-specific impacts may be unavoidable. Therefore, this impact is significant and unavoidable. No additional mitigation measures to reduce this impact to less-than-significant levels are feasible.

Threshold:	Disturb any human remains, including those interred outside of formal cemeteries

Impact CR-3 CONSTRUCTION ACTIVITY ASSOCIATED WITH TRANSPORTATION IMPROVEMENT PROJECTS AND THE LAND USE SCENARIO ENVISIONED BY THE 2022 RTP/SCS COULD RESULT IN DISTURBANCES TO HUMAN REMAINS INCLUDING THOSE INTERRED OUTSIDE OF FORMAL CEMETERIES. POTENTIAL IMPACTS TO HUMAN REMAINS WOULD BE LESS THAN SIGNIFICANT.

Human burials outside of formal cemeteries are often associated with prehistoric archaeological contexts. Therefore, it is possible to encounter unknown human burials during ground disturbing activities. Excavation during construction activities in the SJCOG region would have the potential to disturb these resources, including Native American burials.

In addition to being potential archaeological resources, human burials have specific provisions for treatment in PRC Section 5097, as listed under Section 4.5.2, Regulatory Setting. The California Health and Safety Code Section 7050.5 state no further disturbance may occur until the County Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner where the remains are found, must be notified immediately. If the human remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission, which will determine and notify a most likely descendant (MLD). The MLD must complete the inspection of the site within 48 hours of being granted access and provide recommendations as to the treatment of the remains to the landowner or project sponsor. With adherence to existing regulations, impacts to human remains would be less than significant.

Mitigation Measures

No mitigation measures are required because this impact would be less than significant.

c. Specific 2022 RTP/SCS Projects That May Result in Impacts

All 2022 RTP/SCS projects that require ground disturbance in native soils may result in cultural impacts. Table 2-1 in Section 2, *Project Description* identifies representative projects with the potential to cause or contribute to direct or indirect impacts to cultural resources. These projects were chosen based on their scope and potential to include the development of new transportation infrastructure. While many projects have the potential to impact cultural resources, those requiring substantial ground disturbance in undisturbed areas have greater potential to impact prehistoric archaeological resources. Projects located in urban infill or previously disturbed areas have a greater potential to impact historical built environment resources, as well as historical archaeological resources in older developed areas. Additional specific analysis will be required as individual projects are implemented to determine the actual magnitude of impact. Mitigation measures discussed above would apply to these specific projects.

4.4.4 Cumulative Impacts

The cumulative impact analysis area for cultural resources consists of the SJCOG region and adjoining counties. Information regarding these adjoining counties can be found in Section 3.1 – Environmental Setting, Table 3-1. This is appropriate because cultural resources identified in this larger region will be similar in type and style to those that are or may be present in the SJCOG region. As discussed in Section 4.5.3, the transportation projects and land use scenario envisioned in the proposed 2022 RTP/SCS could require substantial ground disturbance in undisturbed areas or in infill areas, which could impact historic built environment resources and archaeological resources.

The increase in growth in previously undisturbed areas contributes to regional impacts on existing and previously undisturbed and undiscovered historical and archaeological resources, including CEQA-defined "historical resources." While most cultural resources are site-specific, with impacts that are project-specific, others may have regional significance; for example, an historical structure that represents the last known example of its kind would constitute a regional impact if it were affected by future 2022 RTP/SCS project implementation. In addition, there are historic districts or areas that can be affected by multiple or successive projects, over time, resulting in a cumulative impact to the historic resource. For such a resource, cumulative impacts would be significant, and the 2022 RTP/SCS contribution to them would be cumulatively considerable. Mitigation measures outlined in this section would reduce impacts associated with 2022 RTP/SCS projects through impact minimization for built environment and archaeological historical resources. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less than significant level. As such, the 2022 RTP/SCS contribution would remain cumulatively considerable after mitigation.

4.5 Energy

This section evaluates potential impacts to energy from development facilitated by the proposed 2022 RTP/SCS.

4.5.1 Setting

Energy relates directly to environmental quality. Energy use can adversely affect air quality and other natural resources. The vast majority of California's air pollution is caused by burning fossil fuels. Consumption of fossil fuels is linked to changes in global climate and depletion of stratospheric ozone. Transportation energy use is related to the fuel efficiency of cars, trucks, and public transportation; choice of different travel modes (auto, carpool, and public transit); vehicle speeds; and miles traveled by these modes. Construction and routine operation and maintenance of transportation infrastructure also consume energy. In addition, residential, commercial, and industrial land uses consume energy, typically through the use of natural gas and electricity.

a. Energy Supply

California's major sources of fuel production in 2016 comprised of approximately 43.8 percent crude oil, 9.6 percent natural gas, 8.2 percent nuclear, and 1.3 percent biofuels (U.S. Energy Information Administration [EIA] 2021a). California's 2016 major sources of electricity generation was comprised of approximately 36 percent natural gas, 25 percent renewables, 12 percent hydroelectric, 9 percent wind, and 8 percent solar (California Energy Commission [CEC] 2022a).

Natural gas production in 2016 was approximately 1,499,649 thousand cubic feet (Mcf) in the SJCOG region (California Geologic Energy Management Division [CALGEM], formerly California Department of Conservation, Division of Oil, Gas and Geothermic Resources 2017).

The SJCOG region contained 140 active oil wells (CalGEM 2017) but these did not produce any oil in 2016 (CalGEM 2017). Table 4.5-1 illustrates the oil and natural gas produced in the SJCOG region in 2016 compared to statewide statistics.

Table 4.5-1 2016 Oil and Natural Gas Production in the SJCOG Region

Natural Resource	California	SJCOG Total	SJCOG Proportion of Statewide Production
Crude Oil (bbl)	186,660,463	0	0%
Natural Gas (Mcf)	156,005,114	1,499,649	0.008%

Bbl = barrel

Source: CalGEM 2019.

b. Energy Consumption and Sources

Total energy consumption in the United States in 2016 was estimated at approximately 5,612.4 trillion British thermal units (Btu) (U.S. EIA 2021b). Natural provided approximately 40 percent of the energy used in 2016. On a per capita basis, California ranks second to lowest of the states in terms of total energy consumed per capita, or about 44 percent less than the U.S.'s average per capita consumption of 354 million Btu per person (U.S. EIA 2020).

Electricity and Natural Gas

In 2016, California used 290,567 gigawatt hours (GWh) of electricity (CEC 2020a). Table 4.5-2 illustrates the electricity and natural gas consumption of the SJCOG region and their proportion of statewide consumption in 2016.

Table 4.5-2 2016 Electricity and Natural Gas Consumption in the SJCOG Region

County	2016 Electricity Consumption (GWh)[1]	Electricity Consumption Per Capita Consumption (kWh)	Electricity Consumption Statewide Proportion	Natural Gas Consumption 2016 Consumption (MMthm)[2]	Natural Gas Consumption Per Capita Consumption (thm)	Natural Gas Consumption Statewide Proportion
San Joaquin	5,466	7,465	1.9%	195.42	266.90	1.6%

[1]Electricity consumption is quantified in Millions of Kilowatt-Hours (GWh), while per capita electricity is quantified in Kilowatt hours (kWh)

[2]Natural gas consumption is quantified in Millions of Therms (MMthm), while per capita natural gas consumption is Quantified in Therms (thm).

Note: The per capita consumption for natural gas and electricity are determined by using 2016 data from the CEC for overall county wide consumption and divided by the 2016 county population provided by SJCOG (732,185).

Sources: CEC 2020a; CEC 2020b; SJCOG 2022a

As shown in Table 4.5-2, the SJCOG region accounted for approximately 1.9 percent of the State's electricity consumption and approximately 1.6 percent of the State's natural gas consumption in 2016. Natural gas and electricity services within the SJCOG region are provided by Pacific Gas & Electric (PG&E).

Petroleum

Energy consumed by the transportation sector accounts for roughly 39.4 percent of California's energy demand, amounting to approximately 2,935 trillion Btu in 2016 (U.S. EIA 2021c). California's transportation sector 551,752,000 bbl of petroleum fuels in 2016 (U.S. EIA 2021c). Furthermore, petroleum-based fuels are used for approximately 98.2 percent of the State's transportation activity (U.S. EIA 2021c). Most gasoline and diesel fuel sold in California for motor vehicles is refined in California to meet state-specific formulations required by the California Air Resources Board (CARB). Major petroleum refineries in California are primarily concentrated in three counties: Contra Costa, Kern, and Los Angeles (CARB 2020). Fuel consumption for the SJCOG region can be found in Table 4.5-3 below.

Table 4.5-3 Fuel Consumption in SJCOG Region (2016)

Fuel	2016 Annual Fuel Use (million gallons)	2016 Annual Fuel Use (million Btu)	2016 Daily Energy Use (million Btu)	2016 Daily Per Capita Energy Use (thousand Btu)
Gasoline	340	40,897,240	112,047.23	153.03
Diesel	131	17,996,911	49,306.61	67.34
Total	**471**	**58,894,151**	**161,353.84**	**220.37**

Btu = British Thermal Units

Notes: Per capita energy use was calculated by using 2016 fuel use data divided by SJCOG's 2016 population statistic of 732,185. Btus were calculated by multiplying 2016 Annual Fuel Use by U.S. EIA conversion values for motor gasoline and diesel

Sources: CEC 2022b, U.S. EIA 2021d, SJCOG 2022a

Transportation metrics show that approximately 17 million vehicle miles were traveled each day within the SJCOG region in 2016. Table 4.5-4 Illustrates the daily and annual VMT for the SJCOG region in 2016.

Table 4.5-4 Daily and Annual VMT for the SJCOG Region (2016)

Daily VMT	Annual VMT
17,015,116	6,210,517,340

Note: individual numbers may not add up to totals due to rounding.
Source: SJCOG 2022a

Alternative Fuels

A variety of alternative fuels are used to reduce petroleum-based fuel demand. The use of these fuels is encouraged through various statewide regulations and plans, such as the Low Carbon Fuel Standard and Senate Bill (SB) 32. Conventional gasoline and diesel may be replaced, depending on the capability of the vehicle with transportation fuels including the following:

- **Hydrogen** is being explored for use in combustion engines and fuel cell electric vehicles. The interest in hydrogen as an alternative transportation fuel stems from its clean-burning qualities, its potential for domestic production, and the fuel cell vehicle's potential for high efficiency, which is two to three times more efficient than gasoline vehicles. Currently, 47 hydrogen refueling stations are located in California, none of which are located in the SJCOG region (U.S. Department of Energy [DOE] 2022).
- **Biodiesel** is a renewable alternative fuel that can be manufactured from vegetable oils, animal fats, or recycled restaurant greases. Biodiesel is biodegradable and cleaner-burning than petroleum-based diesel fuel. Biodiesel can run in any diesel engine generally without alterations; however, fueling stations have been slow to make it available. There are currently 17 biodiesel refueling stations in California. There is one biodiesel fueling station in the SJCOG region in Lodi, California (DOE 2022).
- **Electricity** can be used to power electric and plug-in hybrid electric vehicles directly from the power grid. Electricity used to power vehicles is generally provided by the electricity grid and stored in the vehicle's batteries. Fuel cells are being explored as a way to use electricity generated onboard the vehicle to power electric motors. There are approximately 34 public electrical charging stations in the SJCOG region (SJCOG 2022b).

4.5.2 Regulatory Setting

a. Federal Laws, Regulations, and Policies

Energy Policy Conservation Act (EPCA) and Corporate Average Fuel Economy (café) Standards

The EPCA of 1975 established nationwide fuel economy standards in order to conserve oil. Pursuant to this Act, the National Highway Traffic and Safety Administration, part of the U.S. Department of Transportation, is responsible for revising existing fuel economy standards and establishing new vehicle fuel economy standards.

The Corporate Average Fuel Economy (CAFE) program was established to determine vehicle manufacturer compliance with the government's fuel economy standards. Compliance with CAFE

standards is determined based on each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the United States.

National Energy Policy Act of 1992 (EPACT92)

EPACT92 calls for programs that promote efficiency and the use of alternative fuels. EPACT92 requires certain federal, state, and local government and private fleets to purchase a percentage of light duty alternative fuel vehicles (AFVs) capable of running on alternative fuels each year. In addition, EPACT92 has financial incentives. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.

Energy Policy Act of 2005

The Energy Policy Act of 2005 provides renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

Energy Independence and Security Act of 2007 (EISA)

EISA is designed to improve vehicle fuel economy and help reduce U.S. dependence on oil. It expands the production of renewable fuels, reducing dependence on oil, and confronting global climate change. Specifically, it:

- Increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel in 2022, which represents a nearly five-fold increase over current levels; and
- Reduces U.S. demand for oil by setting a national fuel economy standard of 35 miles per gallon by 2020 – an increase in fuel economy standards of 40 percent.

b. State Laws, Regulations, and Policies

Warren-Alquist Act

The 1975 Warren-Alquist Act established the California Energy Resources Conservation and Development Commission, now known as CEC. The Act established a State policy to reduce wasteful, uneconomical, and unnecessary uses of energy by employing a range of measures. The CPUC regulates privately-owned utilities in the energy, rail, telecommunications, and water fields.

California Energy Plan

CEC is responsible for preparing the California Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The current (2008) California Energy Plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero-emission vehicles and addressing their infrastructure needs; and encouragement of urban designs that reduce vehicle miles traveled (VMT) and accommodate pedestrian and bicycle access.

Assembly Bill 2076: Reducing Dependence on Petroleum

Pursuant to Assembly Bill (AB) 2076 (Chapter 936, Statutes of 2000), CEC and CARB prepared and adopted in 2003 a joint agency report, *Reducing California's Petroleum Dependence*. Included in this report are recommendations to increase the use of alternative fuels to 20 percent of on-road transportation fuel use by 2020 and 30 percent by 2030, significantly increase the efficiency of motor vehicles, and reduce per capita VMT. Further, in response to the CEC's 2003 and 2005 *Integrated Energy Policy Reports*, the governor directed CEC to take the lead in developing a long-term plan to increase alternative fuel use.

A performance-based goal of AB 2076 was to reduce petroleum demand to 15 percent below 2003 demand.

Integrated Energy Policy Report (IEPR)

Senate Bill (SB) 1389 (Chapter 568, Statutes of 2002) required CEC to conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The CEC shall use these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety.

CEC adopts an IEPR every two years and an update every other year. The 2017 IEPR provides a summary of priority energy issues currently facing the State, outlining strategies and recommendations to further the State's goal of ensuring reliable, affordable, and environmentally responsible energy sources. Energy topics covered in the report include electricity resource and supply plans; electricity and natural gas demand forecasts; natural gas outlooks; transportation energy demand forecasts; energy efficiency savings; integrated resource planning; a barriers study; climate adaptation and resilience; renewable gas; southern California energy reliability; distributed energy resources; strategic transmission investment plans; and existing power plan reliability issues.

Senate Bill 1078: California Renewables Portfolio Standard Program.

SB 1078 (Chapter 516, Statutes of 2002), as expanded under SB 2, establishes a renewable portfolio standard (RPS) for electricity supply. The RPS requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. SB 2 expanded this law and required procurement from eligible renewable energy resources to 33 percent by 2020. In addition, electricity providers subject to the RPS must increase their renewable share by at least one percent each year. The outcomes of this legislation will impact regional transportation powered by electricity.

California Renewables Portfolio Standard

Early legislation established California's renewables portfolio standard (RPS). The program sets continuously escalating renewable energy procurement requirements for the state's load-serving entities. Generation must be procured from RPS-certified facilities. SB 2 (1X) of 2011 obligated all California electricity providers to obtain at least 33 percent of their energy from renewable resources by 2020. The CPUC and CEC are jointly responsible for implementing the program.

SB 350 (Chapter 547, Statutes of 2015) requires the following by 2030: an RPS of 50 percent, and a doubling of efficiency for existing buildings. SB 100 (Chapter 312, Statutes of 2018) establishes a new RPS target of 50 percent by 2026, increases the RPS target in 2030 from 50 to 60 percent, and establishes a goal of 100 percent zero-carbon energy sources by 2045

Senate Bill 350: Clean Energy and Pollution Reduction Act of 2015

The Clean Energy and Pollution Reduction Act of 2015 (SB 350) requires the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50 percent by December 31, 2030. This act also requires doubling of the energy efficiency savings in electricity and natural gas for retail customers, through energy efficiency and conservation by December 31, 2030.

Assembly Bill 1493: Reduction of Greenhouse Gas Emissions

AB 1493 (Chapter 200, Statutes of 2002), known as the "Pavley bill," amended Health and Safety Code sections 42823 and 43018.5 requiring CARB to develop and adopt regulations that achieve maximum feasible and cost-effective reduction of GHG emissions from passenger vehicles, light-duty trucks, and other vehicles used for noncommercial personal transportation in California.

Implementation of new regulations prescribed by AB 1493 required that the State of California apply for a waiver under the federal Clean Air Act. Although EPA initially denied the waiver in 2008, EPA approved a waiver in June 2009, and in September 2009, CARB approved amendments to its initially adopted regulations to apply the Pavley standards that reduce GHG emissions to new passenger vehicles in model years 2009 through 2016. According to CARB, implementation of the Pavley regulations is expected to reduce fuel consumption while also reducing GHG emissions (CARB 2017a).

Assembly Bill 1007: State Alternative Fuels Plan

AB 1007 (Chapter 371, Statutes of 2005) required CEC to prepare a State plan to increase the use of alternative fuels in California. CEC prepared the State Alternative Fuels Plan (SAF Plan) in partnership with the ARB and in consultation with other State, federal, and local agencies. The SAF Plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The SAF Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce GHG emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

Bioenergy Action Plan, Executive Order #S-06-06

Executive Order (EO) S-06-06, April 25, 2006, establishes targets for the use and production of biofuels and biopower, and directs State agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The EO establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. EO S-06-06 also calls for the State to meet a target for use of biomass electricity. The 2011 Bioenergy Action Plan identifies those barriers and recommends actions to address them so that the State can meet its clean energy, waste reduction, and climate protection goals. The 2012 Bioenergy Action Plan updates the 2011 Plan and provides a more detailed action plan to achieve the following goals:

- Increase environmentally and economically sustainable energy production from organic waste;

- Encourage development of diverse bioenergy technologies that increase local electricity generation, combined heat and power facilities, renewable natural gas, and renewable liquid fuels for transportation and fuel cell applications;
- Create jobs and stimulate economic development, especially in rural regions of the state; and
- Reduce fire danger, improve air and water quality, and reduce waste.

Title 24, California Code of Regulations

California Code of Regulations, Title 24, Part 6, is California's Energy Efficiency Standards for Residential and Non-residential Buildings. Title 24 was established by CEC in 1978 in response to a legislative mandate to create uniform building codes to reduce California's energy consumption and provide energy efficiency standards for residential and nonresidential buildings. The standards are updated on an approximately three-year cycle to allow consideration and possible incorporation of new efficient technologies and methods. In 2019, CEC updated Title 24 standards with more stringent requirements effective January 1, 2020. All buildings for which an application for a building permit is submitted on or after January 1, 2017, must follow the 2016 standards. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The CEC Impact Analysis for California's 2016 Building Energy Efficiency Standards estimates that the 2016 Standards are 28 percent more efficient than the previous 2013 standards for residential buildings and 5 percent more efficient for non-residential buildings. The building efficiency standards are enforced through the local plan check and building permit process. Local government agencies may adopt and enforce additional energy standards for new buildings as reasonably necessary due to local climatologic, geologic, or topographic conditions, provided that these standards exceed those provided in Title 24.

California Green Building Standards Code, California Code of Regulations Title 24, Part 11

California's green building code, referred to as CalGreen, was developed to provide a consistent approach to green building within the State. Having taken effect in January 2019, the most recent version of the Code lays out the minimum requirements for newly constructed residential and nonresidential buildings to reduce GHG emissions through improved efficiency and process improvements. It also includes voluntary tiers to further encourage building practices that improve public health, safety, and general welfare by promoting a more sustainable design.

c. Local Laws, Regulations, and Policies

San Joaquin County General Plan

The San Joaquin County General Plan was published December 2016. The General Plan includes the following goals and policies regarding energy consumption:

LU-3.11: The County shall encourage new residential subdivisions and new commercial, office, industrial, and public buildings to be oriented and landscaped to enhance natural lighting and solar access in order to maximize energy efficiency.

LU-9.4: The County shall ensure that all new or renovated County-owned buildings are energy efficient and meet, at a minimum, LEED (Leadership in Energy and Environmental Design) Silver or equivalent standards.

TM-1.7: The County shall develop the transportation system to reduce vehicle miles traveled, conserve energy resources, minimize air pollution, and reduce greenhouse gas emissions.

TM-2.3: The County shall encourage the development of uses in Urban Communities that support the use of public transit, bicycling, walking, and other alternatives to the automobile

TM-9.1: The County shall support the development of alternative fueling stations (e.g. electric and hydrogen) for emerging technologies.

TM-9.2: The County shall encourage the use of parking lots of major employers, commercial shopping centers, and trucks stops for alternative fueling stations (e.g., electric) for automobiles and goods movement trucks.

IS-3.6: The County shall use available clean energy and fuel sources where feasible to operate its buildings, vehicles, and maintenance/construction equipment.

IS-3.9: The County shall encourage contractors to use reduced emission equipment for County construction projects and contracts for services, as well as businesses which practice sustainable operations.

PHS-6.2: The County shall reduce community greenhouse gas emissions by 15 percent below 2005 levels by 2020, and shall strive to reduce GHG emissions by 40 percent and 80 percent below 2020 levels by 2035 and 2050, respectively.

City General Plans

City of Escalon General Plan

The City of Escalon's Safety Element includes a climate adaptation and resilience goal which identifies and prepares for potential adverse effects of climate change. Implementation strategies related to this goal include requiring a review of projects for the potential for new uses of land to contribute or increase impacts associated with climate change, and incorporating measures, such as bicycle and pedestrian friendly amenities and energy-efficient design, into projects to reduce impacts related to climate change.

City of Lathrop General Plan

The City of Lathrop's General Plan identifies energy conservation opportunities through conservation and development, specifically including California Building Code Title 24 requirements in building design and encouraging further implementation of energy conservation features. Policy 4-1-3 states the Community Development Department be required to supply energy conservation awareness brochures in all public meeting places.

City of Lodi General Plan

The City of Lodi General Plan required the preparation and implementation of a comprehensive Climate Action Plan. The Climate Action Plan includes enforceable control measures to reduce energy consumption and greenhouse gas emissions. Of these, policies related to transportation include implementing TDM strategies, reducing parking requirements in new development, implementation of transportation improvements identified in the City of Lodi's Short Range Transit Plan, and encouragement of ridesharing.

City of Manteca General Plan

The City of Manteca General Plan 2023 (2003) describes energy conservation measures within its Resource Conservation Element. These policies include implementing construction standards which promote energy conservation, enforcement of Title 24 energy requirements, implement Transportation System Management measures to reduce the need for car use and petroleum products, and develop alternative transportation systems.

City of Ripon General Plan

The City of Ripon's General Plan ensures the City will continue to enforce energy standards that define construction standards that promote energy conservation such as insulation, air leakage, vapor barriers, space conditioning, water heating plumbing system measures and lighting. The City also promotes energy efficiency through landscape design standards that encourage tree planting.

City of Stockton General Plan

The City of Stockton's Envision Stockton 2040 General Plan addresses energy in its Safety Element. An overarching goal of the Safety Element is to reduce air impacts from mobile and stationary sources of air pollution. Subsequent actions and policies include the use of low-emission construction equipment, installation of energy-star appliances, encourage employers to participate in a transportation demand management (TMD) program facilitated by SJCOG.

City of Tracy General Plan

The City of Tracy General Plan (2011) includes goals and policies to improve air quality and reduce greenhouse gas emissions. The City of Tracy has policies which promote land use patterns that reduce motor vehicle trips, encourage implementing TMD programs, encourage planting trees, and promote use of renewable energy sources, when feasible.

4.5.3 Impact Analysis

a. Methodology and Significance Thresholds

Appendix G of the State CEQA Guidelines identifies the following criteria for determining whether a project's impacts would have a significant impact to energy resources. Because the RTP/SCS is a regional plan and not a specific construction project, TCAG has chosen to expand on threshold 1, below, such that energy consumption can be evaluated at a regional level rather than project level. This is consistent with the programmatic nature of the EIR. For the purposes of this EIR, implementation of the 2022 RTP/SCS would have a significant impact if it would:

1. Result in significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation (including transportation), based on whether the project would:
    a. Result in an increase in overall per-capita energy consumption relative to baseline conditions;
    b. Result in an increased reliance on fossil fuels and decreased reliance on renewable energy sources
2. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Use of a 2016 Baseline

For the purposes of this energy analysis, a 2016 baseline is used to match the SJCOG transportation modeling base line. This allows an accurate *apples to apples* comparison to the same baseline year. Known 2016 VMT data generated by SJCOG is used to calculate 2016 baseline direct energy use. This baseline is consistent with the baseline used in SJCOG's Sustainable Communities Strategy, and as such is more reflective of the comparative analysis made within the SCS than if data from a different year was used.

Direct and Indirect Energy Consumption

For this analysis, the calculation of total energy consumption follows the Input-Output methodology suggested by Caltrans (Caltrans Division of Engineering Services, Office of Transportation Laboratory, Energy and Transportation Systems, July 1983). It should be noted that the Caltrans methodology provides for the calculation of the cumulative energy consumption. Not only does the methodology include energy consumption that would be due solely to the construction of 2022 RTP/SCS projects, it also includes energy consumption that is not due to the 2022 RTP/SCS, but rather is due to socioeconomic growth (e.g., population and employment), land use policies, and the existing transportation infrastructure.

Energy consumption from transportation projects is categorized in terms of "direct" and "indirect" energy. Direct energy is the fuel that propels vehicles – it is consumed directly by the automobile, bus, or transit vehicle. Indirect energy is the energy needed to construct, operate, and maintain the roadway and rail system and manufacture and maintain the vehicles using these systems (Caltrans 1983). Indirect energy accounts for construction-related energy (e.g., the energy required to construct transportation improvements), which is anticipated to be consumed through the life of the plan as several transportation improvement projects may be undertaken concurrently, and is therefore characterized as a long-term, operational energy use. Indirect energy also accounts for the maintenance of a roadway over the life of a project, which is also considered a long-term, operational energy use.

Direct Energy Consumption for Transportation Projects

Direct energy is that energy used in the daily operation of the transportation system, including the propulsion of passenger vehicles (automobiles, vans, and trucks) and transit vehicles (buses and trains). The direct energy analysis for the project is based on 2016 and 2046 vehicle miles traveled (VMT) with and without the 2022 RTP/SCS.

The 2016 daily gasoline and diesel fuel consumption data for the SJCOG region was converted to Btu (refer to Table 4.5-3) and divided by region wide daily VMT (refer to Table 4.5-4) to derive a regional Btu/VMT conversion factor of 9,483 Btu per VMT.

It should be noted that the Btu/VMT factor is forecast to continue to decrease into the future as a result of improved fuel economy. Applying the 2016-based factor to future year (2046) VMT therefore provides a reasonable worst-case evaluation of energy consumption as the energy efficiency of vehicles in 2046 is anticipated to be higher than the fuel efficiency of current vehicles.

Indirect Energy Consumption

Indirect energy is the energy required to construct, operate, and maintain the transportation network, as well as to manufacture and maintain on-road vehicles and transit vehicles. Therefore, construction-related impacts associated with the 2022 RTP/SCS are included in the indirect energy

analysis. The indirect energy analysis was conducted using the Input-Output methodology developed by Caltrans (1983). This method converts VMT, lanes miles, or construction dollars into energy consumption based on data from other transportation projects in the United States. Table 4.5-5 shows the indirect energy consumption factors used in this analysis. It should be noted that indirect energy consumption due to production of fuel and transportation/transmission to the end users is not included in this analysis, as any such analysis would be speculative.

Table 4.5-5 Indirect Energy Consumption Factors

Mode	Factor
Manufacturing	
Passenger Vehicles	1,410 Btu/VMT
Transit Buses	3,470 Btu/VMT
Roadway (construction)	27,300 Btu/VMT
Maintenance	
Passenger Vehicles	1,400 Btu/VMT
Transit Buses	13,142 Btu/VMT
Rail	7,060 Btu/VMT

Source: Caltrans 1983

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with transportation projects and the land use scenario contained within the proposed 2022 RTP/SCS. Section 4.5.3.c summarizes the impacts associated with capital improvement projects in the proposed 2022 RTP/SCS. Due to the programmatic nature of the proposed 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvement projects and future projects under the land use scenario envisioned by the proposed 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1a: Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation (including transportation), based on whether the project would result in an increase in overall per-capital energy consumption relative to baseline conditions

Impact E-1 FUTURE TRANSPORTATION IMPROVEMENT PROJECTS AND IMPLEMENTATION OF THE LAND USE SCENARIO ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD NOT RESULT IN SIGNIFICANT ENVIRONMENTAL IMPACT DUE TO THE WASTEFUL, INEFFICIENT, OR UNNECESSARY CONSUMPTION OF ENERGY RESOURCES. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Daily operation of the SJCOG region's transportation system uses energy in the form of fuel consumed by propulsion of passenger vehicles (automobiles, vans, and trucks) and transit vehicles (buses and trains). Some highway and roadway improvements included in 2022 RTP/SCS would potentially increase vehicle capacity, allowing a greater number of vehicles on facilities in the SJCOG region. Increases in motor vehicle trips are primarily a combined function of population growth and employment growth. It should be noted that population growth and an increase in VMT would occur within the region regardless of whether 2022 RTP/SCS is implemented. As a result, energy

consumption as it relates to vehicles would increase beyond the 2016 baseline in any scenario. The proposed 2022 RTP/SCS would help to minimize energy consumption by improving the overall efficiency of the transportation system. In addition, many of the proposed 2022 RTP/SCS projects (e.g., bikeway and pedestrian, rail, transit, and Transportation Demand Management [TDM] projects) would improve the availability of alternative transportation modes, help reduce congestion and resultant harmful air quality emissions in the SJCOG region. Generally, the availability of these alternative modes would be expected to potentially reduce overall motor vehicular trips, VMT, and associated energy consumption.

Construction and maintenance of proposed 2022 RTP/SCS projects (including construction and maintenance of roadways and rail lines) would result in short-term consumption of energy resulting from the use of construction equipment and processes. During construction activities, energy would be needed to operate construction equipment. In addition, roadway and transit construction materials, such as asphalt, concrete, surface treatments, steel, rail ballast, as well as building materials, require energy to be produced, and would likely be used in projects that involve new construction or replacement of older materials. The CalGreen Code includes specific requirements related to recycling, construction materials, and energy efficiency standards, which would apply to construction of roadway and transit improvement projects envisioned by 2022 RTP/SCS and help to minimize waste and energy consumption. All construction and maintenance conducted pursuant to 2022 RTP/SCS, or as a result of improvements made by 2022 RTP/SCS, would be required to comply with the CalGreen Code and would thus reduce energy consumption associated with buildout of the proposed 2022 RTP/SCS.

Table 4.5-6 shows the VMT and total energy use (Btu) in the SJCOG region under 2016 conditions and conditions in 2046 with implementation of 2022 RTP/SCS.

Table 4.5-6 Transportation Energy Use

Year	Daily VMT	Direct Energy Use (Daily MMBtu)	Per-Household Energy Use (Million Btu per year)[1]	Per-Capita Energy Use Daily (MMBtu)
2016	17,015,116	161,353.84	244.76	0.22
Proposed 2022 RTP/SCS in 2046	23,495,442	222,807.28	254.00	0.22
Change % (Baseline vs. Proposed 2022 RTP/SCS) [1]	**38%**	**38%**	**3.77%**	**0.0%**

[1]Per-Household Energy Use was calculated using housing assumptions generated by SJCOG

Source: SJCOG 2022a, 2022c.

As shown in Table 4.5-6, countywide daily VMT, total daily energy use, and per capita energy use would increase over time as the result of regional socioeconomic (population and employment) growth. However, the proposed 2022 RTP/SCS would result in the same per capita energy usage when compared to 2016 conditions.

Transportation Projects

The transportation improvements proposed under the proposed 2022 RTP/SCS would result in an efficient transit system. The proposed 2022 RTP/SCS also would result in greater availability of public transit and other alternative modes of transportation, such as bicycling, which does not consume fuel energy and also reduces traffic congestion. The reduction in overall congestion resulting from these service level improvements would reduce fuel consumption and promote fuel

efficiency beyond what is accounted for in the above analysis. As mentioned previously, improvements to State fuel efficiency standards for vehicles and State-mandated increases in the supply and use of alternative transportation fuels would further reduce fuel consumption, such as implementation of an electric vehicle charging station plan.

New transportation facilities that require energy for operation, such as signal lighting, roadway or parking lot lighting, and electronic equipment would increase energy demand. New landscaping irrigation would also increase energy demand through water pumping and treatment. However, energy consumption would not be unnecessary or wasteful, as all lighting, signage and irrigation systems would comply with applicable energy efficiency requirements within the California Building Code. Therefore, the transportation improvements projects included in the proposed 2022 RTP/SCS would not result in inefficient, unnecessary, or wasteful consumption of gasoline or diesel fuel or an increased reliance on fossil fuels.

Land Use Projects

The proposed 2022 RTP/SCS emphasizes a regional land use scenario that promotes land development in existing commercial corridors. Mixed use and infill projects would help reduce VMT and energy use because they would locate people closer to existing goods and services, thereby resulting in shorter vehicle trips and/or promoting walking or biking, and they would locate people closer to existing transportation hubs, thereby encouraging the use of alternative modes of transit (e.g., buses) resulting in fewer vehicle trips. Operation of future land development projects would increase overall demand for energy beyond existing demand; however, such development would not require unusual, unnecessary, or wasteful amounts of energy. Future land use projects would be constructed using standard building practices. These projects would also be subject to the CALGreen Code and Title 24 of the California Energy Code, which set forth specific energy efficiency requirements related to design, construction methods and materials.

In summary, the proposed 2022 RTP/SCS would reduce energy consumption, thus it would not result in wasteful or inefficient energy consumption within the region relative to baseline conditions. Therefore, the proposed 2022 RTP/SCS impacts on energy usage would be less than significant.

Mitigation Measures

No mitigation measures are required.

Threshold 1b:	Result in a significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resource, during project construction or operation (including transportation), based on whether the project would result in an increased reliance on fossil fuels and decreased reliance on renewable energy sources

Impact E-2 THE PROPOSED 2022 RTP/SCS WOULD NOT INCREASE RELIANCE ON FOSSIL FUELS OR DECREASE RELIANCE ON RENEWABLE ENERGY SOURCES. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

The proposed 2022 RTP/SCS, resulting transportation projects, and implementation of the land use scenario envisioned by the proposed 2022 RTP/SCS are required to follow State regulations, such as California's Green Building Standards and SB 350, by incorporating alternative energy use. PG&E is the utility provider for the vast majority of the SJCOG region, and pursuant to CPUC regulations, utilities such as PG&E and SCE utilize a long-term planning process to plan for increased energy

demand in the future with its publication of ten-year integrated resource plans. The most recent PG&E plan, titled PG&E's 2020 Integrated Resource Plan, details planned projects between 2020 and 2030 that aim to ensure compliance with North American Electric Reliability Corporation standards, improve transmission system access for renewable generation to meet Renewable Portfolio Standard (RPS) goals and targets, improve service reliability for end users and coordinate long-term plans for PG&E's transmission system (PG&E 2020). Thus, renewable energy options would be incorporated in the proposed 2022 RTP/SCS projects as future transportation improvements and implementation of the land use scenario envisioned by proposed 2022 RTP/SCS rely on the aforementioned service providers, and each has integrated a reduction in reliance on fossil fuels as part of their standards and goals.

Furthermore, as described under Impact E-1, construction and operation of land use development envisioned under the proposed 2022 RTP/SCS would be required to comply with relevant provisions of CALGreen and Title 24 of the California Energy Code. In addition, land use and transportation projects would be required to comply with the State's Bioenergy Action Plan, Alternative Fuels Plan, among other regulatory standards to reduce GHG and encourage alternative energy use.

Transportation Projects

As shown in Table 4.5-6 and discussed above, the proposed 2022 RTP/SCS would result in the same per-capita energy consumption as 2016 conditions. The proposed 2022 RTP/SCS includes projects that would support alternative energy use and potentially decrease VMT including roadway improvements that incorporate multi-use paths along existing corridors. For instance, there are multiple projects planned by the proposed 2022 RTP/SCS in Lodi, Ripon, and Stockton which would support active transportation, such as bicycle lane installation, street improvements, and crosswalk installation. These specific projects support alternative energy use by providing residents with non-motorized transportation options. Also, as mentioned above, the proposed 2022 RTP/SCS includes other transportation projects which are subject to the State's Alternative Fuels Plan, thereby encouraging alternative energy use.

Land Use Projects

The proposed 2022 RTP/SCS emphasizes a regional land use scenario that promotes mixed-use and infill development in existing commercial corridors in combination with high quality transit service and improved bicycle and pedestrian infrastructure, which would result in the same per-capita energy consumption, despite induced demand that would stem from population growth. Operation of future infill projects would increase the overall demand for energy beyond existing demand, however, such development would not require unusual, unnecessary, or wasteful amounts of energy shown through the same per-capita energy use with implementation of the land use scenario envisioned in the proposed 2022 RTP/SCS. As mentioned above, land use projects would incorporate renewable energy options through reliance on a service provider that has integrated a reduction in reliance on fossil fuels as part of their standards and goals. Therefore, the proposed 2022 RTP/SCS would not increase reliance on fossil fuels or decrease reliance on renewable energy sources. Impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Threshold 2:	Conflict with or obstruct a state or local plan for renewable energy or energy efficiency

Impact E-3 2022 RTP/SCS WOULD NOT CONFLICT WITH OR OBSTRUCT A STATE OR LOCAL PLAN FOR RENEWABLE ENERGY OR ENERGY EFFICIENCY. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

As discussed in 4.5.2, *Regulatory Setting*, several State plans, the County's adopted General Plan, city General Plans, and local Climate Action Plans include energy conservation and energy efficiency strategies intended to enable the State and the County to achieve GHG reduction and energy conservation goals. A full discussion of the proposed 2022 RTP/SCS's consistency with GHG reduction plans is included in Section 4.9, *Greenhouse Gas Emissions and Climate Change*.

As discussed in Impact E-1, the proposed 2022 RTP/SCS would not result in an increase in per capita energy use in the region and would not result in energy used in an unnecessary or wasteful manner. Accordingly, inconsistencies between the proposed 2022 RTP/SCS and adopted plans and policies related to energy conservation have not been identified. The discussion below further examines consistency with adopted plans and policies related to energy conservation.

SJCOG monitors regulations related to fuel efficiency standards and alternative fuel vehicles. The proposed 2022 RTP/SCS would not conflict with such regulations (e.g., Energy Policy and Conservation Act and CAFE Standards, EPAct, Energy Independence and Security Act of 2007, AB 1493: Reduction of Greenhouse Gas Emissions, AB 1007: State Alternative Fuels Plan).

In addition, the 2019 Integrated Energy Policy Report (IEPR) includes a set of strategies to address California's future energy needs. Key topics covered in the report include electricity resource and supply plans; electricity and natural gas demand forecasts; natural gas outlooks; transportation energy demand forecasts; energy efficiency savings; integrated resource planning; a barriers study; climate adaptation and resilience; renewable gas; distributed energy resources; strategic transmission investment plans; and existing power plan reliability issues. The proposed 2022 RTP/SCS would not conflict with these policies. Refer to Section 4.9, *Greenhouse Gas Emissions and Climate Change,* for a discussion of greenhouse gas emissions reductions related to the proposed 2022 RTP/SCS.

Locally, the proposed 2022 RTP/SCS would be consistent with the San Joaquin County General Plan that includes goals and policies that encourage energy conservation and energy efficiency. The plan encourages the use of renewable energy, energy conservation and energy efficiency techniques in all new building design, orientation, construction, and support of alternative transportation and fuels. Local General Plans include similar goals and policies. The proposed 2022 RTP/SCS would be consistent with the State and local plans, as the proposed 2022 RTP/SCS would implement strategies that are designed to enhance the connection between land use and transportation choices through projects supporting energy efficiency. Therefore, the proposed 2022 RTP/SCS would be consistent with State energy efficiency plans, the County's adopted energy conservation and efficiency strategies contained in its General Plan and local General Plans' efficiency policies. As described under Impact E-1, construction and operation of the proposed 2022 RTP/SCS would be required to comply with relevant provisions of CALGreen and Title 24 of the California Energy Code. Therefore, this impact would be less than significant, and no mitigation is required.

Mitigation Measures

No mitigation measures are required.

c. Specific 2022 RTP/SCS Projects That May Result in Impacts

The analysis within this section discusses the potential energy related impacts associated with the proposed 2022 RTP/SCS. The transportation projects within the proposed 2022 RTP/SCS are evaluated herein in their entirety and are intended to promote energy efficient, environmentally sound modes of travel and facilities and services rather than cause adverse impacts. However, as described above, the proposed 2022 RTP/SCS would decrease per-household and per-capita energy usage associated with transportation projects in the region. These effects have been found to be less than significant, as described above. Taken separately, even if any specific of the proposed 2022 RTP/SCS projects increases energy use, those impacts would be less than significant. For example, any project that required construction equipment or lighting improvements would increase energy usage, but based on the above, the overall impacts of the totality of the proposed 2022 RTP/SCS are less than significant Thus, no specific projects are listed in this section related to the adverse impacts on energy in the SJCOG region.

4.5.4 Cumulative Impacts

The cumulative impact analysis area for energy consists of the SJCOG region and adjoining counties. Information regarding these adjoining counties can be found in Section 3, *Environmental Setting*. Future development in this region that could impact energy use is considered in the analysis. This cumulative extent is used to evaluate potential wasteful or inefficient use of energy resulting in an increase overall per capita energy consumption or result in increased reliance on fossil fuels and decreased reliance on renewable energy sources or conflict with state or local plans for renewable energy or energy efficiency across the cumulative impact area.

Future development in the cumulative impact analysis area would result in short term consumption of energy resulting from construction equipment and use of fuel for vehicles. Operation of future developments would also require energy but would be subject to CalGreen and California Building Energy Efficiency Standards. Furthermore, pursuant to the California Public Utilities Commission, utilities such as Pacific Gas and Electric must utilize a long-term planning process to plan for increased energy demand in the area and would account for increased development and an increase in population. As such, growth in the cumulative impact analysis area and increased energy demand would be accounted for and would not result in the inefficient, unnecessary, or wasteful use of energy.

The proposed 2022 RTP/SCS would increase demand for energy resources such as natural gas, electricity, and transportation fuels. However, many of the transportation improvement projects under the 2022 RTP/SCS would conserve transportation energy by relieving congestion and contributing towards other transportation efficiencies, resulting in lower per capita transportation energy consumption in 2046 than in the 2016 baseline year. In addition, renewable energy sources steadily constitute a larger proportion of California's energy supply makeup, resulting in a trend of decreased dependency on fossil fuels and increased dependency on renewable energy sources. As a result, the 2022 RTP/SCS would not contribute to significant cumulative impacts related to wasteful or inefficient use of energy resources and services because energy would be used more efficiently on a per capita basis with the proposed 2022 RTP/SCS as compared to 2016 conditions.

In addition, adherence to existing applicable policies and regulations, such as CalGreen, California Building Energy Efficiency Standards, and the Low Carbon Fuel Standard, would ensure the incorporation of energy efficiency measures in the design and operation of future projects facilitated by the proposed 2022 RTP/SCS and other cumulative projects. As such, the proposed

2022 RTP/SCS would not contribute to a cumulative impact to the wasteful, unnecessary, or inefficient use of energy. The proposed 2022 RTP/SCS contribution to cumulative impacts related to energy consumption would not result in the inefficient use of energy resources. As such, the proposed 2022 RTP/SCS impact on wasteful, inefficient, or unnecessary energy use, or conflicts with plans for renewable energy or energy efficiency, would not be cumulatively considerable.

This page intentionally left blank.

4.6 Agriculture and Forestry Resources

This section evaluates potential impacts to agriculture and forestry resources from development facilitated by the proposed 2022 RTP/SCS.

4.6.1 Setting

a. Overview of Regional Agriculture and Forestry

Agriculture consisting of crop farming is the largest industry in the SJCOG region and contributes a substantial amount of money to the region's economy. San Joaquin County ranks is seventh in agricultural producing counties in the United States and is one of eleven California counties with a billion dollars or more production in crop value.

Agricultural Lands

SJCOG's planning area includes expansive agricultural lands as well as forestry resources. The specific agricultural resources of within the SJCOG region are discussed below. San Joaquin County consistently ranks in the top 10 counties of the State in overall agricultural productivity. Agriculture continues to be the main producing industry in the County. For the 2020 crop year, the County had a total gross production value of $2,351,958,000, surpassing the gross production value for the prior year by $304,196,000, an increase of 12.9 percent. The top ten revenue crops that were produced in the County in 2020 included almonds, nursery products, tomatoes, grapes, walnuts, blueberries, hay, and cherries (San Joaquin County 2020).

San Joaquin County is among California's leaders in the production of dairy, grapes, and nuts. In 2018, 742,687 acres of land in the County were classified as "agricultural land", according to the California Department of Conservation. Of this land, more than 391,984 acres were classified as "Prime Farmland". Due to conversion to other/nonagricultural uses, the amount of prime farmland in the County has been declining since the Department started compiling such information in 1998 (California Department of Conservation 2021). Similarly, the amount of land under Williamson Act Contracts has been declining in recent years. The decrease in agricultural land can partially be attributed to the encroachment of urban uses into farming areas, creating land use conflicts and the loss of productive agricultural soil (San Joaquin County 2016).

The urban areas within San Joaquin County are almost exclusively surrounded by agricultural zone districts; these districts range from AG-40 to the east of Stockton, Manteca. AG-40 north of Lodi, and Lathrop. There are two AG-160 zones, one south of Tracy and the other on the eastern border of the County. Thus, the SJCOG region mostly consists of a variety of rural land uses. This rural land contains a high percentage of rich agricultural soils which are in production. These areas are characterized by a wide variety of productive soils, from the deep organic soils of the Delta to the young alluvial soils that cover much of the valley floor. Nearly all the soil types found within the County are suitable for agricultural production. The SJCOG region is noted for their high-quality irrigated crops, including rice, sorghum, corn, and wheat. Cattle ranching is one of the top revenue producers in the SJCOG region and a significant amount of farmland within San Joaquin County is characterized by this land use (San Joaquin County 2020). Agricultural areas in the County also provide benefits such as wildlife habitat, flood control, groundwater recharge, and energy production.

Since 1998, there has been an overall County-wide decrease of agricultural land acreage. However, from 2016 to 2018 there was a net gain of 352 acres of Prime Farmland, a net loss of 455 acres of Farmland of Statewide Importance, but a net gain of 4,174 acres of Unique Farmland. During the same period, urban and built-up land had a net total increase of 2,211 acres, Farmland of Statewide Importance had a net total decrease of 2,960 acres, and grazing land had a net total decrease of 2,856 acres (California DOC 2019a).

b. Important Farmland

To characterize the environmental baseline for agricultural resources, Important Farmland Maps produced by the California Department of Conservation's (DOC) Farmland Mapping and Monitoring Program (FMMP) were reviewed. Figure 4.6-1 illustrates the intersection of Important Farmland, forest land, and projects listed under the 2022 RTP/SCS in the region. Unless otherwise expressed, the future use of "Important Farmland" specifically includes the following definitions provided by the DOC (DOC 2019b):

Prime Farmland

Land which has the best combination of physical and chemical characteristics to produce crops. It has the soil quality, growing season and moisture supply needed to produce sustained high yields of crops when treated and managed, including water management, according to current farming standards.

Farmland of Statewide Importance

Land that is like Prime Farmland but with minor shortcomings, such as greater slopes or less ability to hold and store moisture.

Unique Farmland

Land of lesser quality soils is typically used to produce specific high economic value crops. It has the special combination of soil quality, location, growing season and moisture supply needed to produce sustained high quality or high yields of a specific crop when treated and managed according to current farming methods. It is usually irrigated but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Examples of crops include oranges, olives, avocados, rice, grapes and cut flowers.

Williamson Act Lands

The California Land Conservation Act of 1965, commonly referred to as the "Williamson Act", enables local governments to restrict the use of specific parcels of land to agricultural or related open space use (DOC 2019c). As of January 1, 2015, 499,654 acres of land are under Williamson Act contract in the SJCOG region with 60,255 acres under the Farmland Security Zone ("FSZ") (DOC 2016d).

Important Farmland Trends

According to the most recent Farmland Conversion Report prepared by the DOC, Prime Farmland increased by 3,669 net acres, coupled with a Farmland of Statewide Importance decreasing by 455 net acres. Partially offsetting these losses was the addition of 3,772 net acres of irrigated crops on soils mapped as Unique Farmland.

As shown in Table 4.6-1, the SJCOG region experienced a 709-acre net increase in Important Farmland between 2016-2018 (DOC 2019a). Net increases in acreages occurred for Prime Farmland and Unique Farmland, and net decreases for both Farmland of Statewide Importance and Farmland of Local Importance. Total acreages in 2018 for Prime Farmland was 381,984 acres, 82,163 acres for Farmland of Statewide Importance, and 85,694 acres of Unique Farmland, totaling 550,291 acres of Important Farmland (all three categories combined).

Table 4.6-1 Important Agriculture Land Conversion in the SJCOG Region 2016-2018

	Total Acreage Inventoried		2016-2018 Acreage Changes			
Land Use Category	2016	2018	Acres Lost (-)	Acres Gained(+)	Total Acreage Changed	Net Acreage Changed
Prime Farmland	381,632	381,984	1,071	1,858	4,068	352
Farmland of Statewide Importance	82,618	82,163	265	466	1,387	-455
Unique Farmland	81,922	85,694	681	4,174	4,576	3,772
Important Farmland Total[1]	**546,172**	**550,291**	**2,017**	**6,498**	**10,031**	**3,669**

[1] Important Farmland represents all Prime Farmland, Farmland of Statewide Importance, and Unique Farmland.

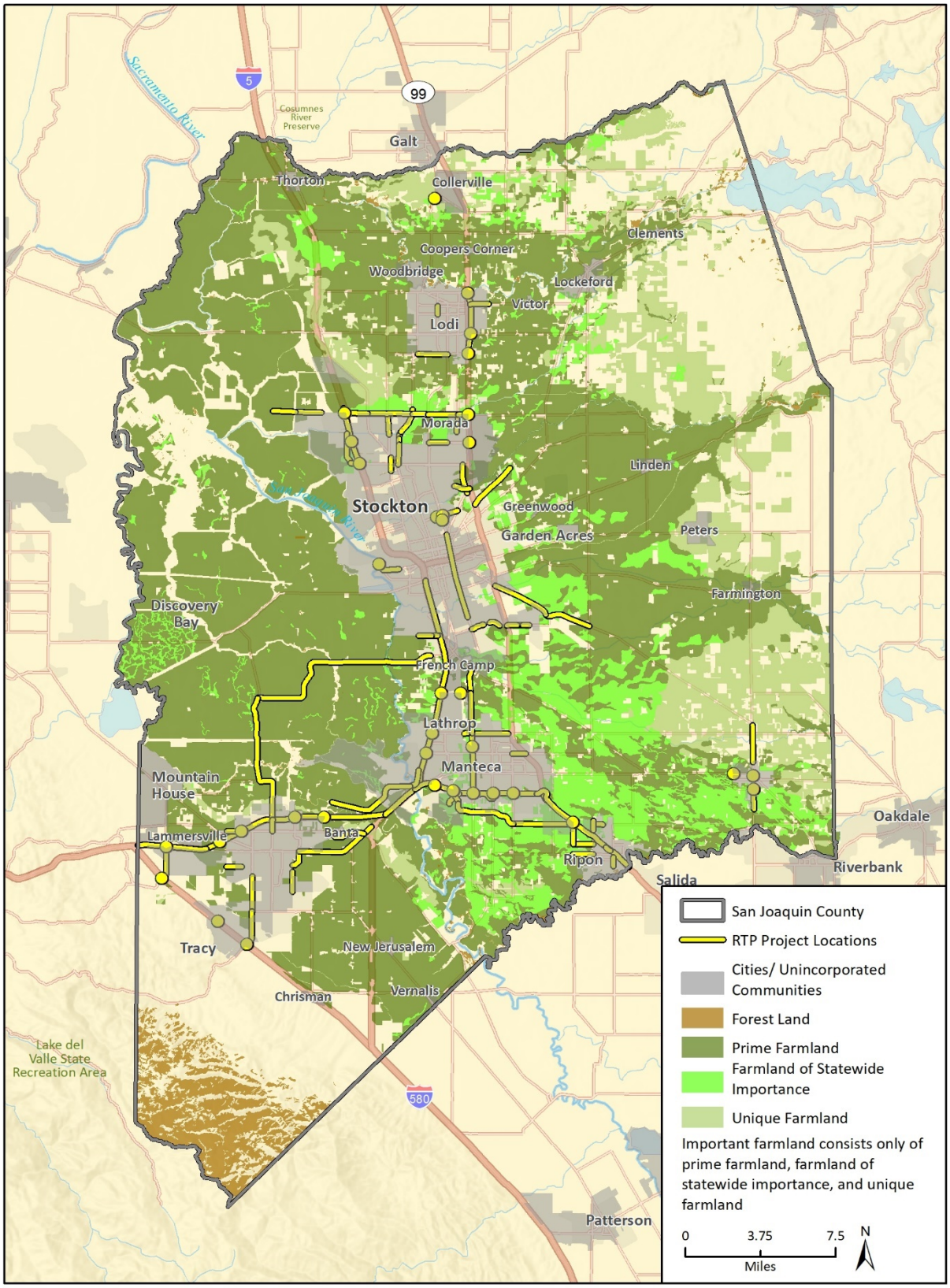
Source: DOC 2019a.

Forest Lands and Oak Woodlands

Within the SJCOG region, there is approximately 22,990.44 acres of forest land, located primarily in the southwest area of the region and smaller areas scattered throughout the SJCOG region. Forest land is defined in PRC Section 12220(g) is "land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits."

Oak woodland is defined as a habitat with over 10 percent of the canopy cover comprised of native oak trees. There are 20,000 acres of oak woodland in the SJCOG region. As shown in Figure 4.6-1 these areas are located in the southwest and northeast portions of the SJCOG region. See Section 4.4, *Biological Resources*, for more discussion of forest lands found in the region. There are no Timber Harvesting Plans or Timberland Production Zones within the region. However, there is a blue oak habitat in the SJCOG region, which is considered Forest land as defined above. See Section 4.4, Biological Resources, for more discussion of oak woodlands found in the SJCOG region.

Figure 4.6-1 Important Farmland and Forest Land in the SJCOG Region



Imagery provided by Esri and its licensors © 2022.
Additional data provided by CWHR, 2021 and FMMP, 2018.

4.6.2 Regulatory Setting

a. Federal, Laws, Regulations, and Policies

Federal Farmland Protection Act (FFPA)

The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that to the extent possible federal programs are administered to be compatible with state, local units of government, and private programs and policies to protect farmland. Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a federal agency or with assistance from a Federal agency.

Federal Farm and Ranchland Protection Program

The Federal Farm and Ranchland Protection Program (FRPP) is a voluntary easement purchase program that helps farmers and ranchers keep their land in agriculture. Pursuant to sections 1539 to 1549 of the FPPA of 1981, the Secretary of Agriculture is directed to establish and carry out a program to "minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to the extent practicable, will be compatible with state, unit of local government, and private programs and policies to protect farmland." (7 USC 4201-4209 & 7 USC 658). The program provides matching funds to state, tribal, or local governments and nongovernmental organizations with existing farmland protection programs to purchase conservation easements or other interests in land. The FRPP was re-authorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill). The NRCS manages the program. Technical Committee, awards funds to qualified entities to conduct their farmland protection programs. Although a minimum of 30 years is required for conservation easements, priority is given to applications with perpetual easements.

Federal Forest Legacy Program

The Federal Forest Legacy Program was a part of the 1990 Farm Bill. Its purpose is to identify and protect environmentally important forestlands that are threatened by present or future conversion to non-forest uses. The program provides conservation easements and gives priority to lands that can be effectively protected and managed, as well as lands that have significant scenic, recreational, timber, riparian, fish and wildlife, threatened and endangered species, and other cultural or environmental values. Properties that are "working forests," whereby the forestland is managed for the production of forest products, are also eligible under this program. Involvement in this program by private landowners is voluntary.

Timberland Production Zones

The Z'berg-Warren-Keene-Collier Forest Taxation Reform Act of 1976 requires counties to enable zoning of land used for growing and harvesting timber as Timberland Preserve Zones (TPZ). A TPZ is a 10-year restriction on the use of timberland. Similar to the relationship between the Williamson Act and agricultural land, Timberland Preserve Zones are limited to growing and harvesting timber and other similar uses.

b. State Laws, Regulations, and Policies

Farmland Mapping and Monitoring Program

The DOC, under the Division of Land Resource Protection, developed the FMMP to monitor the conversion of the state's farmland to and from agricultural use. Data is collected at the county level to produce a series of maps identifying eight land use classifications using a minimum mapping unit of 10 acres. The program also produces a biannual report on the amount of land converted from agricultural to non-agricultural use. The program maintains an inventory of state agricultural land and updates the "Important Farmland Series Maps" every two years (DOC 2019b).

Williamson Act

The California Land Conservation Act of 1965, Sections 51200 et seq. of the California Government Code, commonly referred to as the "Williamson Act", enables local governments to restrict the use of specific parcels of land to agricultural or related open space use. Landowners enter contracts with participating cities and counties and agree to restrict their land to agriculture or open space use for a minimum of ten years. In return, landowners receive property tax assessments that are much lower than normal because they are based upon farming and open space uses as opposed to full market (speculative) value. Local governments receive an annual subvention of forgone property tax revenues from the state via the Open Space Subvention Act of 1971 (DOC 2019c).

The Right to Farm Act of 1981

The Right to Farm Act of 1981 (Civ. Code, § 3482.5) is meant to protect commercial agricultural operations from nuisance complaints that may occur when agricultural operations are conducting business in a "manner consistent with proper and accepted customs." The code states operations that have been in business for three or more years and not nuisances upon commencement of operation shall not be considered a nuisance because of new land use.

California Farmland Conservancy Program Act

The California Farmland Conservancy Program Act of 2010 formed the California Farmland Conservancy Program (CFCP) and provides grants for agricultural conservation easements. Agricultural conservation easements are created to support agriculture and prevent development on the subject parcels. Easements funded by the CFCP must be suitable for commercial agriculture.

Open Space Subvention Act

The Open Space Subvention Act (OSSA) of 1972 was enacted on January 1, 1972, to provide for the partial replacement of local property tax revenue foregone as a result of participation in the Williamson Act and other enforceable open space restriction programs. Participating local governments receive annual payment on the basis of the quantity (number of acres), quality (soil type and agricultural productivity), and, for Farmland Security Zone contracts, location (proximity to a city) of land enrolled under eligible, enforceable open space restrictions. There have been no subvention payments since Fiscal Year 2010.

California Timberland Productivity Act of 1982

The California Timberland Productivity Act (CTPA) of 1982 describes the powers and duties of local government in protecting timberlands. The law is designed to maintain an optimum amount of

timberland, ensuring its current and continued availability by establishing TPZ on all qualifying timberland, which restrict land use to growing and harvesting timber and other compatible uses. The Act discourages premature or unnecessary conversion of timberland to urban or other uses and expansion of urban services into timberland and encourages investment in timberlands based on reasonable expectation of harvest. The CTPA also provides that timber operations conducted in accordance with California forest practice rules shall not be restricted or prohibited due to land uses in or around the location of the timber operations.

c. Regional and Local Laws, Regulations, and Policies

Land Conservation Trusts

A land trust works to preserve land or conservation easement acquisition. A land conservation trust is another type of organization devoted to protecting open space, agricultural lands, wildlife habitats, and natural resource lands. There are approximately 80 established trusts in California. Local and regional land trusts, organized as charitable organizations under federal tax laws, are directly involved in conserving land for its natural, recreational, scenic, historical, and productive values. Local governments and special districts, either on their own or working with land trusts and conservancies, can acquire fee title to agricultural and open space lands or purchase development rights to preserve rural and agricultural areas, watersheds, or critical habitat, or to create public parks and recreational areas. There is currently one land trust located in the SJCOG region: the San Joaquin River Parkway and Conservation Trust. In part, the Trust was established to promote educational, recreational, and agricultural uses of the San Joaquin River.

San Joaquin County General Plan 2035

According to the 2035 County of San Joaquin General Plan, agriculture will remain the mainstay of the County's economy, while agriculturally related industries and non-agricultural industries will play an increasingly larger role in the local economy. Many of the planning principles and policies in the General Plan protect existing agricultural lands and industries while providing support for advancement and diversification of agriculturally related enterprises (San Joaquin County 2016).

City of Escalon General Plan

The City of Escalon's General Plan policy regarding farmland is to maximize the amount of farmland, open space, and wildlife habitat preservation on lands outside of the City by establishing a greenbelt, including land not designated for future annexation (City of Escalon 2019).

City of Lathrop General Plan

The City of Lathrop contains three sub-plan areas. Outside of these areas, exclusive agricultural zoning will be continued. Furthermore, the protection of agricultural lands outside of the sub-plan areas shall be reinforced by City policies to not permit the extension of public utilities to such lands (City of Lathrop 2004).

City of Lodi General Plan

Within the City of Lodi's General Plan, conservation of open space is identified as important to the City itself and surrounding community. Multiple policies are identified in this General Plan to prevent excessive agricultural land conversion, including prioritizing infill development within the

existing City limits, compact development in new growth areas, and the continuation of most agricultural activities in the Planning Area (City of Lodi 2010).

City of Manteca General Plan

The City of Manteca's General Plan stated goal is promoting the continuation of agricultural uses within the planning area and to discourage the premature conversion of agricultural land to non-agricultural uses, while providing for future urban development in Manteca (City of Manteca 2003).

City of Ripon General Plan

Policy D1 of the City of Ripon's General plan discourages the premature conversion of agricultural lands to reduce the intrusion of urban development into agricultural areas. Strategies include deterring development of properties subject to Williamson Act contracts for which a notice of non-renewal has not been filed (City of Ripon 2006).

City of Stockton General Plan

The City of Stockton's General Plan states the need for local agricultural lands provide needed buffers between Stockton and neighboring cities, plus some of the most important scenic vistas in the Planning Area. Accordingly, the City has adopted a Right to Farm ordinance to protect local agricultural lands, which limits the circumstances under which an agricultural operation may be considered a nuisance and establishes notification requirements for agricultural neighbors of this protection (City of Stockton 2018).

City of Tracy General Plan

The City of Tracy's General Plan's Open Space and Conservation Element provides a regulatory framework for the City to maintain its identity through the preservation of agricultural lands and the creation of new park and open space lands (City of Tracy 2011).

4.6.3 Impact Analysis

a. Methodology and Significance Thresholds

Appendix G of the State CEQA Guidelines identifies criteria for determining whether the proposed 2022 RTP/SCS would have a significant impact on agricultural or forestry resources, namely an analysis of whether or not the 2022 RTP/SCS would

1. 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 nonagricultural use;
2. Conflict with existing zoning for agricultural use, or a Williamson Act contract;
3. Conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timber Production;
4. Result in the loss of forest land or conversion of forest land to non-forest use; or
5. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use.

The analysis assesses the impacts to agricultural, timber, and forest resources that could result from implementation of the 2022 RTP/SCS. Impacts are assessed in terms of changes to both land use and transportation infrastructure using County-provided data and SJCOG forecasts related to projected population, housing, and employment growth. The methodology for determining the significance of these impacts applies the significance criteria above to the future land use pattern and transportation network. The development of new transportation facilities may affect agricultural, timber and forest resources, through both direct and indirect effects, including traversing agricultural, timberland, and forest lands.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with projects contained within the 2022 RTP/SCS. Section 4.6.3(c) summarizes the impacts associated with capital improvement projects proposed in the 2022 RTP/SCS. Due to the programmatic nature of the 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1:	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 nonagricultural use
Threshold 2:	Conflict with existing zoning for agricultural use, or a Williamson Act contract
Threshold 5:	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use

IMPACT AG-1 PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PATTERNS ENVISIONED BY THE 2022 RTP/SCS COULD RESULT IN THE CONVERSION OF IMPORTANT FARMLAND TO NONAGRICULTURAL USE, AND/OR CONFLICT WITH EXISTING ZONING FOR AGRICULTURE. THIS WOULD BE A SIGNIFICANT AND UNAVOIDABLE IMPACT.

As discussed in Section 4.2.1, the SJCOG region contains approximately 381,984 acres of Prime Farmland, 82,163 acres of Farmland of Statewide Importance, and 85,694 acres of Unique Farmland (DOC 2018). The 2022 RTP/SCS land use pattern emphasizes primarily consists of projects in developed areas, such as infrastructure maintenance, public transit operations, and improvements to existing roads. However, transportation improvement projects in the 2022 RTP/SCS adjacent to agricultural areas (Figure 4.6-1), particularly those requiring new rights-of-way, could also have indirect impacts on agricultural productivity. Although the incorporated cities in the SJCOG region are urbanized, many cities border agriculture, including FMMP-designated Important Farmland.

Conversely, the 2022 RTP/SCS envisions growth in areas already served by transit, redirecting housing growth towards more compact unit types, and a mix of uses and neighborhood design to enable an increase walkability and bike trips. transportation corridors, which are generally located in urbanized areas of cities and unincorporated communities. Such land use development within urbanized areas would not be expected to result in agricultural resource impacts since they would be located within existing urban areas. However, implementation of the 2022 RTP/SCS may impact lands that are currently agricultural but located near areas converted to urban uses; increased development pressure as nearby land values increase, new routes to previously inaccessible areas,

and nuisances from urban development spread to agricultural lands may contribute to a loss of agricultural land. It is important to note that for federally funded projects, implementing and local agencies are required to follow the rules and regulations of the Farmland Protection Policy Act including determining the impact by completing the Farmland Conversion Impact Rating form (AD-1006), if required.

Transportation improvement projects that involve roadway widening have the potential to affect narrow segments of agricultural land located immediately along the existing right-of-way of proposed improvements. In addition, improving, expanding, and extending existing roadways, along with the installation of roadway improvements, could remove some barriers to development taking place on the urban edge as the region's connectivity and access improves from these projects.

In developing the 2022 RTP/SCS forecasted development pattern and transportation system, SJCOG relied on the policies of local governments to develop urbanization assumptions based on the most recent information available. The general plans and related environmental documentation for each local jurisdiction identify potential impacts to agricultural resources that could occur because of Plan implementation. As such, the 2022 RTP/SCS was developed consistent with the applicable general plans. However, new or different impacts not identified in previous environmental documentation may occur as a result of the 2022 RTP/SCS.

A determination of the impacts to Important Farmland, agricultural zoning, and conflicts with Williamson Act contracts would be made on a case-by-case basis as individual projects are implemented. Many individual projects would likely not create significant impacts, particularly those that involve only minor widening along existing rights-of-way or would be located in urbanized areas zoned for development. Nevertheless, as the actual magnitude of impacts from individual projects cannot be determined at this time, and because of the potential increase in the average annual conversion rate of agricultural land to non-agricultural uses over the next 25 years, this is a potentially significant impact.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures for applicable transportation projects that would result in impacts to Important Farmland, and where feasible and necessary based on site-specific considerations. San Joaquin County and incorporated cities in the County should implement these measures, where relevant to land use projects implementing the 2022 RTP/SCS. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site specific conditions.

AG-1 Impact Avoidance and Minimization

Project sponsors shall implement measures, where feasible and necessary based on project-and site-specific considerations that include but are not limited to those identified below.

- Require project relocation or corridor realignment, where feasible, to avoid Important Farmland;
- Manage project construction to minimize the introduction of invasive species or weeds that may affect agricultural production on agricultural land adjacent to project sites. Managing project construction may include washing construction equipment before bringing equipment on-site, using certified weed-free straw bales for construction Best Management Practices (BMPs), and other similar measures.

- Provide buffers, berms, setbacks, fencing, or other project design measures to protect surrounding agriculture, and to reduce conflict with farming that could result from implementation of transportation improvements and/or development included as a part of the RTP/SCS;
- Achieve compensatory mitigation in advance of impacts through purchase or creation of mitigation credits or the implementation of mitigation projects through Regional Advance Mitigation Planning, as deemed appropriate by permitting agencies; and/or
- Require acquisition of conservation easements on land in the same jurisdiction, if feasible, and at least equal in quality and size to converted Important Farmland, to offset the loss of Important Farmland.

IMPLEMENTATION AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are San Joaquin County and incorporated cities within the SJCOG region. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate.

Significance After Mitigation

Implementation of Mitigation Measure AG-1 would require avoidance or compensation for Important Farmland impacts by specific projects included in the 2022 RTP/SCS, thereby reducing the impact of conversion of Important Farmland to non-agriculture use and conflicts with agricultural zoning and Williamson Act contracts. However, the mitigation would not ensure that the future land use development pattern and transportation projects could feasibly relocate or realign to avoid conversion of Farmland, lands zoned for agriculture, and lands under Williamson Act contract to a less than significant level. As a result, the aforementioned mitigation would reduce impacts, but impacts would remain significant and unavoidable.

Threshold 3:	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])
Threshold 4:	Result in the loss of forest land or conversion of forest land to non-forest use

Impact AG-2 THE PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PATTERNS ENVISIONED BY THE 2022 RTP/SCS WOULD NOT CONFLICT WITH EXISTING ZONING FOR FOREST LAND, TIMBERLAND, OR TIMBERLAND PRODUCTION, NOR CONVERT FOREST LAND TO NON-FOREST USES. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Forest lands are generally located in the southwestern area of the SJCOG region, as shown in Figure 4.6-1. Due to existing state and federal protections for these areas, the rate of forest land loss due to urbanization would be low. The 2022 RTP/SCS and county and city polices focus development in areas that do not include forest land, as defined by statutes. Land use strategies contained within the 2022 RTP/SCS encourage growth in developed areas rather than a more dispersed land use pattern that could result in conversion of forest land, timberland, or Timberland Production zones. As such, the 2022 RTP/SCS would not conflict with existing zoning for forest land, timberland, or timber production, nor convert forest land to non-forest use.

Because land use strategies contained within the 2022 RTP/SCS would help to encourage growth in developed areas, and because the forest lands and timber areas are outside the identified land use development areas in the SJCOG region, impacts on conversion of forest land or conflicts with land zoned for forest land, timberland, or timberland production would be less than significant.

Mitigation Measures

No mitigation is required.

c. Specific RTP/SCS Projects That May Result in Impacts

Table 4.6-2 identifies examples of transportation projects with the potential to cause or contribute to direct or indirect impacts to agricultural resources such as those discussed above. These projects are representative and were selected based on their potential scope and likelihood of disturbing agricultural lands. Additional specific analysis would be required as individual projects are implemented to determine the project specific magnitude of impact. Mitigation discussed above would apply to these specific projects.

Table 4.6-2 2022 RTP/SCS Projects That May Result in Agriculture Impacts

Project Jurisdiction and Location	Improvement
Caltrans	
SR-120	Widen 4 to 6 lanes
SR-99/120 Connector Project Phase 1B	Widen the northbound SR 99 to westbound SR 120 connector ramp from one-lane to two-lanes; Add an auxiliary lane in the existing median of westbound SR 120 from Main Street to SR 99; Convert the existing 99/120 separation structure to two lanes and construct a new separation structure to service the eastbound 120 to northbound 99 connector ramp
SR 99/120 Connector Project Phase 1C	Add braided off ramps from SR 99 and SR 120 to Austin Road; Add loop on ramp from Austin Road to northbound SR 99 and to westbound SR 120; Add auxiliary lane in each direction on SR 99 from SR 120 to approximately 1.9 mile south of Austin Road and relocate the frontage road
Escalon BNSF grade separation	Construct a grade separation in Escalon at the BNSF Railroad
City of Lathrop	
Golden Valley Parkway	Construct new roadway parallel to I-5, 2 lanes from Brookhurst Boulevard to Stewart Road
Golden Valley Parkway	Construct new roadway parallel to I-5, 4 lanes from Stewart Road to Paradise Road
Golden Valley Parkway	Widen from 2 to 4 lanes, from Brookhurst Boulevard to Stewart Road
Roth Road Grade Separation (Easterly)	Construct 4 lane grade separation between Roth Road and Railroad
City of Lodi	
Harney Lane	Widen from 2/3 lane collector to 4 lanes divided arterial
Victor Road (SR-12)	Widen from 2 to 4 lanes. Add center dual left turn lane, turn pockets at intersections and median separation with landscape
Ham Lane	Widen 2/3 lanes to 4 lanes
City of Manteca	
SR-120 at Airport Way	Widen existing roadway from 2 to 4 lanes
Airport Way	Widen from 2 to 4 lanes from SR-120 to Yosemite Avenue
Airport Way	Widen from 2 to 4 lanes from Lathrop Road to Roth Road

Project Jurisdiction and Location	Improvement
Raymus Expressway	Construct new 2 lane expressway from ST-120 to Woodward Avenue
Atherton Drive	Construct new 4 lane roadway from Woodward Avenue to McKinley Avenue
Raymus Expressway	Construct new 2 lane expressway from Woodward Avenue to Main Street
Airport Way	Widen from 4 to 6 lanes from SR 120 to Lathrop Road
City of Ripon	
Jack Tone Road, Phase 1	Widen from 2 to 6 lanes from Santos Road to South Clinton Avenue
Garrison Road Gap Closure	Construct 2 lane extension of Garrison Road
W. Ripon Road	Widen from 2 to 6 lanes from Jack Tone Road to Olive Expressway
Canal Boulevard Extension	Construct 4 lane extension of Canal Boulevard from Jack Tone Road to Olive Expressway
Olive Expressway	Construct 6 lane Olive Expressway
City of Stockton	
Morada Lane	Widen from 3 to 6 lanes from West Lane to UPRR
Arch Road	Widen from 2 to 6 lanes from Fite Court to Frontier Way
Arch Road	Widen from 2 to 6 lanes from Frontier Way to SR-99
Maranatha Drive	Construction of new 4 lane road from Wilson Way to March Lane
Maranatha Drive	Construction of new 4 lane road from March Lane to Hammer Lane
Lower Sacramento Road	Widen from 2 to 6 lanes from Marlette Road to Pixley Slough
French Camp Road	Widen from 2 to 6 lanes from Wolfe Road to Manthey Road
March Lane Extension	Construction of new 8 lane road from Holman Road to SR 99
City of Tracy	
I-205/Lammers Road/Eleventh Street	Construct interchange I-205 at Eleventh Street, realign and widen Eleventh Street to 6-lanes north of Grant Line to Byron Road. Construct auxiliary lane Hansen to Eleventh, in westbound I-205 Eleventh Street to Grant Line Road.
I-580 at Lammers Road	Construction of new interchange
Corral Hollow Road	Widen from 2 to 4 lanes from Parkside Drive to Linne Road
Schulte Road	Extend 4 lane roadway from Faith Lane to Lammers Road
Grant Line Road	Widen from 5 to 6 lanes from Naglee Road to Lammers Road
Corral Hollow Road Widening	Widen 2 to 4 lanes including ROW and construction of two bridges from Linne Road to I-580
MacArthur Drive	Extend 4 lane roadway on new alignment and construct railroad grade separation from Mt. Diablo Road to Eleventh Street
Tracy Boulevard	Widen from 4 lane minor arterial to 4 lane major arterial from I-205 to Eleventh Street
San Joaquin County	
Tracy Boulevard (Tracy to Unincorporated County)	Passing lanes and channelization from I-205 to Howard Road
Roth Road (Unincorporated County)	Widen from 2 to 4 lanes with shoulders from UPRR to Airport Way
Airport Way (Unincorporated County)	Widen from 2 to 4 lanes from Roth Road to French Camp Road
Escalon Bellota Road	Widen from 2 to 4 lanes with shoulders from Escalon City limits to Mariposa Road

Project Jurisdiction and Location	Improvement
SJRRC	
Rail Project SJ07-6001	Construct double main track, panelized turnouts, relocate/renew siding turnout, and realign existing trackage.
Rail Project SJ11-6001	In Stockton, construct track connections and grade separate the BNSF Stockton Subdivision and UPRR Fresno Subdivision diamond crossing
Rail Project SJ07-6009	Realignment of tracking
Rail Project SJ14-6002	Connection from UPRR Fresno Sub to UPRR Oakland Sub

4.6.4 Cumulative Impacts

The cumulative impact analysis area for agriculture and forestry resources consists of the SJCOG region and adjoining counties. Information regarding these adjoining counties can be found in Section 3.1 – *Environmental Setting,* Table 3-1. Future development in this region that could impact farmland or forestry is considered in the analysis. This cumulative extent is used to evaluate potential loss/conversion of farmland and forest land within the context of regional diminishment of these resources.

Future development within the cumulative impact analysis area would convert agricultural land to non-agricultural uses and may result in conflicts with agricultural zoning and Williamson Act contracts. In addition, future development adjacent to agricultural land has the potential to result in a loss of farmland due to land use conflicts, which adds to the cumulative conversion of agricultural lands, including areas designated as Important Farmland by the FMMP. Cumulative impacts to agricultural resources would be significant.

Implementation of Mitigation Measure AG-1 would reduce the contribution of the proposed 2022 RTP/SCS to cumulative agricultural land impacts. However, the mitigation would not ensure that the future land use development pattern and transportation projects could feasibly relocate or realign to avoid impacts, and impacts would remain significant and unavoidable. The contribution of the proposed 2022 RTP/SCS to cumulative impacts to agricultural and Williamson Act lands would therefore remain cumulatively considerable post-mitigation.

In the cumulative impact analysis area, forestland and timber resources are primarily located in Stanislaus County, specifically the Stanislaus National Forest. National forests and national parks are protected by federal law and greatly restrict any type of urban development that can occur in these areas. Thus, future development within the cumulative impact analysis area would not convert forestland to non-forest uses and thus would not result in conflicts with forest zoning. Cumulative impacts to forestland and timber resources would therefore be less than significant. The contribution of the proposed 2022 RTP/SCS to cumulative impacts to forestland and timber resources would not be cumulatively considerable.

4.7 Environmental Justice

This section evaluates potential impacts to environmental justice communities from development facilitated by the proposed 2022 RTP/SCS.

4.7.1 Setting

a. Overview

Environmental justice (EJ) is defined in the California Government Code as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies" (Gov. Code § 65040.12 (e)). In May 2012, the California Attorney General's office released a report titled "Environmental Justice at the Local and Regional Level – Legal Background" which interprets CEQA to include considerations of environmental justice, although environmental justice is not explicitly mentioned in the CEQA guidelines. The report defines "fairness" in this context to mean that "the benefits of a healthy environment should be available to everyone, and the burdens of pollution should not be focused on sensitive populations or on communities that already are experiencing its adverse effects."

In the transportation context, environmental justice seeks to ensure that underserved communities are involved in transportation planning and decision-making, benefit equitably from transportation plans and investments, and do not suffer disproportionate burdens from any adverse impacts. Prior to environmental justice emerging as a regulatory issue, the issues underlying environmental justice emerged in the Civil Rights movements and are reflected in Title VI of the Civil Rights Act. In 1994, President Bill Clinton signed Executive Order 12898 -- Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which became effective on February 11, 1994. The Executive Order directs every federal agency to make environmental justice part of its mission by identifying and addressing the effects of all programs, policies, and activities on minority and low-income populations. Hence, the U.S. Department of Transportation (DOT) issued its own order, 5610.2(a), to clarify and reinforce environmental justice policies related to transportation planning. The Federal Highway Administration (FHWA), a branch of the DOT, has established policies for integrating environmental justice principles into existing operations. There are three main elements to FHWA's environmental justice policy:

- Avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects on minority and low-income populations;
- Ensure full and fair participation by all potentially affected communities in the transportation decision-making process; and
- Prevent reduction or significant delay in the receipt of benefits by minority populations and low-income groups.

Issues of environmental justice impact low-income populations; minority individuals and populations; and low-mobility populations, and may include, but are not limited to concerns related to health and safety, economic development, society and culture, accessibility, and the natural environment. These populations are discussed further below.

Minority populations are further defined by the guidance document prepared by the Council on Environmental Quality (CEQ) titled *Environmental Justice: Guidance Under the National Environmental Policy Act* (CEQ 1997). In that document, CEQ defines "minority persons" as "individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black (not of Hispanic origin; or Hispanic" (CEQ 1997). Hispanic or Latino refers to an ethnicity whereas American Indian, Alaskan Native, Asian, Pacific Islander, and Black/African American (as well as White or European American) refers to racial categories; thus, for Census purposes, individuals classify themselves into racial categories as well as ethnic categories, where ethnic categories include Hispanic/Latino and non-Hispanic/Latino. The 2020 U.S. Census allowed individuals to choose more than one race. For this analysis, consistent with guidance from CEQ (1997), "minority" refers to people who are Hispanic/Latino of any race, as well as those who are non-Hispanic/Latino of a race other than White or European-American. While "Other" is quantified, it is not factored into the analysis of concentrations of minority population.

b. Demographics

The SJCOG region contains seven incorporated cities: Escalon, Lathrop, Lodi, Manteca, Ripon, Stockton, and Tracy. In 2020, approximately 41.2 percent of the SJCOG region population was concentrated in the City of Stockton, with the next most populous cities being Tracy (11.9 percent) and Manteca (10.7 percent). The County also contains other census-designated places and

Table 4.7-1 summarizes the racial and ethnic composition for communities within the SJCOG region. Table 4.7-2 summarizes median income, households below poverty level, and unemployment rates for communities within the region.

Table 4.7-1 Racial and Ethnic Composition of the SJCOG Region (2020)

Location	White	Black	American Indian	Asian	Pacific Islander	Two or More Races	Hispanic or Latino	Minority
California	36.5%	5.4%	0.3%	14.6%	0.3%	3.4%	39.1%	63.5%
SJCOG Region (All San Joaquin County)	30.7%	6.8%	0.2%	15.5%	0.6%	4.3%	41.7%	69.3%
Incorporated Cities								
Escalon	74.4%	0.3%	0.0%	0.8%	0.4%	7.3%	16.8%	25.6%
Lathrop	23.2%	6.1%	0.0%	26.0%	0.5%	3.9%	40.1%	76.8%
Lodi	45.8%	1.4%	0.1%	10.8%	0.4%	3.6%	37.8%	54.2%
Manteca	39.0%	4.1%	0.4%	10.9%	1.3%	3.8%	40.4%	61.0%
Ripon	65.6%	0.4%	0.0%	2.4%	0.0%	4.2%	26.9%	34.4%
Stockton	19.4%	11.0%	0.2%	20.5%	0.5%	4.6%	43.5%	80.6%
Tracy	28.8%	5.1%	0.1%	17.2%	1.1%	5.4%	42.1%	71.5%
Census-Designated Places (CDP)								
August	15.6%	1.6%	0.0%	3.1%	0.2%	2.5%	76.9%	84.4%
Country Club	33.5%	6.2%	0.1%	4.7%	0.0%	2.7%	52.7%	66.5%
Garden Acres	16.1%	0.9%	0.5%	0.2%	0.3%	0.3%	81.8%	83.9%

Note: "Hispanic" is defined as an ethnicity while the other categories are races. To prevent double counting, persons whom identified themselves as Hispanic were excluded from racial population counts, but comprise a portion of the total minority population. Minority populations plus the population identifying as white comprise 100 percent of the SJCOG region.

Source: U.S. Census Bureau 2022a

Table 4.7-2 Income and Poverty Rate in the SJCOG Region (2020)

Location	Median Household Income	Poverty Rate All People	Percent Unemployed
California	$78,672	12.6%	10.3%
SJCOG Region (All San Joaquin County)	$68,628	13.7%	11.6%
Escalon	$64,844	9.6%	11.5%
Lathrop	$90,179	11.5%	11.8%
Lodi	$64,153	14.7%	10.4%
Manteca	$76,846	10.2%	10.1%
Ripon	$89,110	6.5%	5.8%
Stockton	$58,393	16.8%	13.2%
Tracy	$95,741	8.6%	9.9%
August	$34,781	26.9%	9.6%
Country Club	$57,391	15.6%	16.3%
Garden Acres	$46,276	18.4%	14.9%

Sources: U.S. Census Bureau 2022b; Employment Development Department (EDD) 2020

As shown in Table 4.7-1, approximately 69.3 percent of SJCOG region residents, or 520,869 persons, were identified as being a minority race or ethnicity (U.S. Census Bureau 2022a). The largest minority group in the SJCOG region is Hispanic (41.7 percent) followed by Asian (15.5 percent). As shown Table 4.7-2 the median income for the SJCOG region was $68,628, the poverty rate was 13.7 percent, and the unemployment rate was 11.6 percent (U.S. Census Bureau 2022b; EDD 2020). The 2020 State median income was $78,672 and the poverty rate was 12.6 percent (U.S. Census Bureau 2022b). EDD statistics identify a 5.5 percent unemployment rate in California as of 2022 (EDD 2022).

EJ Communities

EJ communities in the SJCOG region were identified using socioeconomic data provided by the American Community Survey (ACS) Five-Year Estimates for 2020 (U.S. Census Bureau 2022b). For the purpose of this analysis, two socioeconomic indicators were considered in identifying EJ communities: minority population and households living in poverty. Minority persons are those who identify as Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, some other race, multiple races, or Hispanic/Latino of any race. Non-minority persons are those self-reporting as white and not of Hispanic/Latino ethnic origin. The Census defines poverty thresholds for each year based on the size of a family and number of children under 18 years old. As such, the Census poverty threshold varies. For example, for 2020, the Census poverty threshold for one person under age 65 with no children was $13,465, while for a family of four with two children the threshold was $26,246 (Census 2022c).

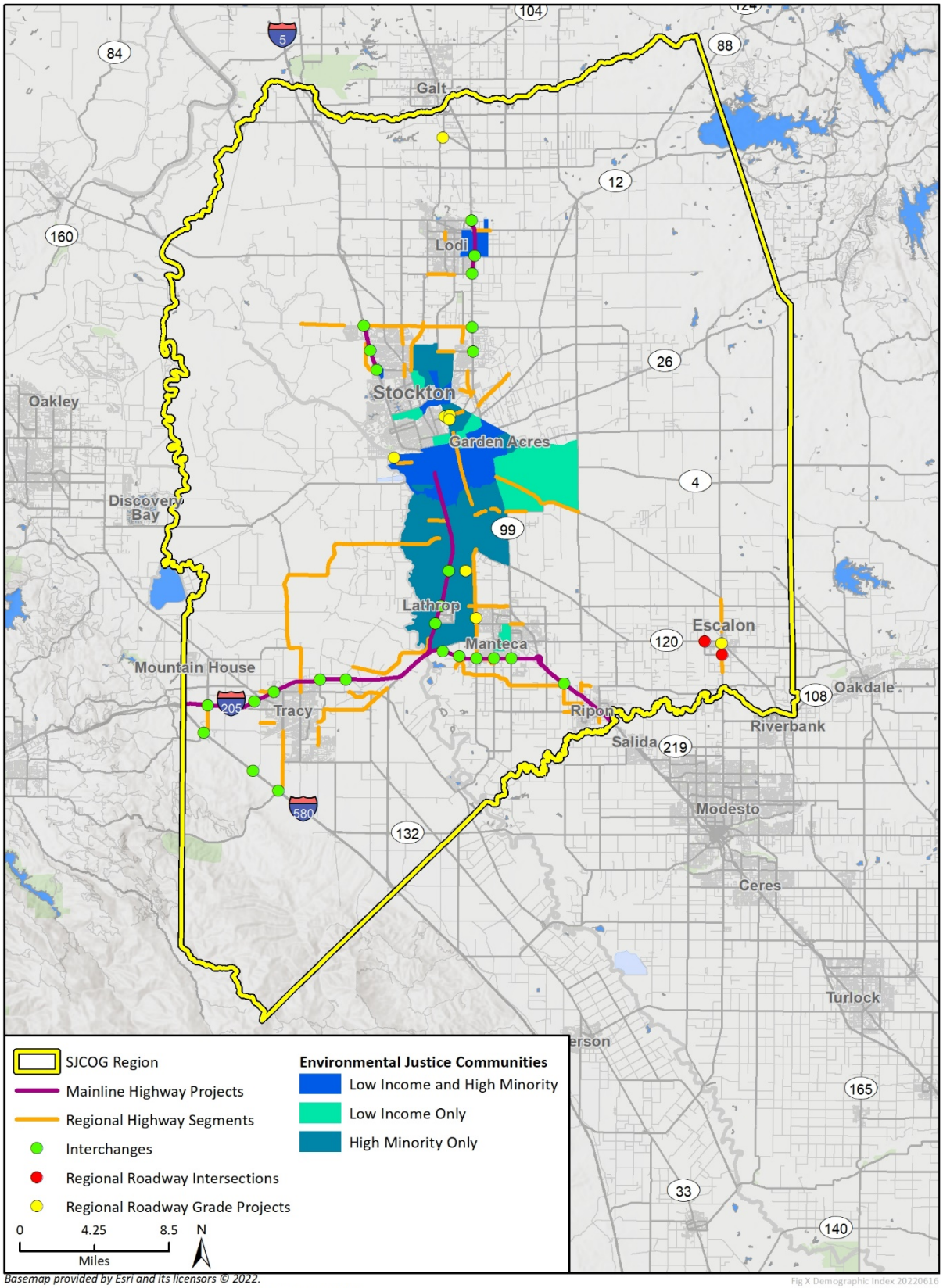
For the purposes of the proposed 2022 RTP/SCS, EJ communities were mapped by SJCOG using the following criteria (SJCOG 2022a):

- Census tracts with at least 40 percent of the population living at or below 150 percent of the federal poverty level as defined by the Census Bureau.

- Census tracts where at least 80 percent of population is minority. The U.S. Census definition was used for minority persons.

Figure 4.7-1 shows the identified EJ communities within the SJCOG region.

Figure 4.7-1 EJ Communites in the SJCOG Region



Basemap provided by Esri and its licensors © 2022.
Additional data provided by San Joaquin Council of Governments, 2022.

Fig X Demographic Index 20220616

4.7.2 Regulatory Setting

a. Federal Laws, Regulations, and Policies

Executive Order 12898

Executive Order 12898, established in 1994, directed federal agencies to (1) identify and address disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, (2) develop a strategy for implementing environmental justice, and (3) promote nondiscrimination in federal programs that affected human health and the environment, as well as provide minority and low-income communities access to public information and public participation. This executive order established an interagency working group on environmental justice chaired by the Environmental Protection Agency.

Executive Order 14008

Executive Order 14008, signed in January 2021, created the White House Environmental Justice Advisory Council and the White House Environmental Justice Interagency Council. The order directs agencies to develop programs, policies, and activities to address disproportionately high and adverse human health, environmental, climate-related, and other cumulative impacts on disadvantaged communities. Executive Order 14008 also established the Justice40 Initiative. Through the Justice40 Initiative, federal agencies are directed to work with states and local communities in order to deliver at least 40 percent of the overall benefits from federal investments in climate and clean energy to disadvantaged communities. Programs that are in alignment with the Justice40 Initiative include the Department of Homeland Security's Flood Mitigation Assistance Program and the Department of Housing and Urban Development's Lead Hazard Reduction and Healthy Homes grants.

b. State Laws, Regulations, and Policies

California Government Code Section 65040.12

Senate Bill (SB) 115 of 1999 and SB 89 of 2000 (Section 65040.12 of the Government Code) required the California Office of Planning and Research (OPR) to:

- Consult with the Secretaries of the California Environmental Protection Agency (CalEPA), the Resources Agency, and the Business, Transportation, and Housing Agency, the Working Group on Environmental Justice established pursuant to Section 72002 (now Section 71113) of the Public Resources Code, any other appropriate State agencies, and all other interested members of the public and private sectors in this State.
- Coordinate the Office's efforts and share information regarding environmental justice programs with the CEQ, the United States Environmental Protection Agency, the General Accounting Office, the Office of Management and Budget, and other federal agencies.
- Review and evaluate any information from federal agencies that is obtained as a result of their respective regulatory activities under federal Executive Order 12898, and from the Working Group on Environmental Justice established pursuant to Section 72002 of the Public Resources Code.

SB 89 also required the formation of an advisory committee, California Environmental Justice Advisory Committee (CEJAC) to provide information and assistance to the Secretary of CalEPA and Interagency Working Group on Environmental Justice (IWG) in establishing and implementing an intra-agency strategy to achieve environmental justice. In 2004, the CalEPA released its Environmental Justice Strategy and Action Plan based on the IWG recommendations for identifying and addressing any gaps in existing programs, policies, or activities that may impede the achievement of environmental justice and suggested procedures for collecting, maintaining, analyzing, and coordinating information relating to its environmental justice strategy.

California Government Code Section 11135

California Government Code Section 11135 states that no person in the State of California shall, on the basis of race, national origin, ethnic group identification, religion, age, sex, sexual orientation, color, or disability, be unlawfully denied full and equal access to the benefits of, or be unlawfully subjected to discrimination under, any program or activity that is conducted, operated, or administered by the State or by any State agency, is funded directly by the State, or receives any financial assistance from the State.

Senate Bill 1000

Senate Bill 1000, signed in 2016, requires local governments to identify environmental justice communities in their jurisdictions and address environmental justice in their general plans. The bill requires the environmental justice element, or related environmental justice goals, policies, and objectives integrated into other elements, to identify objectives and policies to reduce health risks in disadvantages communities. Senate Bill 1000 required the environmental justice element, or the environmental justice goals, policies, and objectives in other elements, to be adopted or reviewed upon the adoption or next revision of two or more elements concurrently on or after January 1, 2018.

Senate Bill 244

Senate Bill 244, signed in 2011, requires that general plans identify disadvantaged unincorporated communities, disadvantaged communities located outside of the city limit, but within the Sphere of Influence. Senate Bill 244 requires that cities analyze infrastructure and fire service needs and deficiencies and assess potential funding mechanisms for expansions of services and facilities.

California Fair Housing Task Force

The California Fair Housing Task Force (CFHTF) is a joint task force created in February 2017 between the California Tax Credit Allocation Committee and the California Department of Housing and Community Development. The CFHTF creates opportunity maps to identify areas in every region of the state which identify opportunities for equitable development and inform the California Tax Credit Allocation Committee policies. In December 2017, the California Tax Credit Allocation Committee adopted the map to accompany policies aimed at increasing access to areas for families and children in housing financed with 9 percent Low Income Housing Tax Credits. The CFHTF categorizes areas into ‘resources’ with areas with the highest opportunity for equitable development categorized as ‘Highest Resource’ or ‘High Resource.’

c. Local Laws, Regulations, and Policies

City General Plans and Regulations

Senate Bill 1000 required a consideration of environmental justice in a city's General Plan to be adopted or reviewed upon the adoption or next revision of two or more General Plan elements concurrently on or after January 1, 2018. The City of Stockton is the only city in the SJCOG region that has updated their general plan since January 1, 2018. Therefore, the City of Stockton is the only city in the SJCOG region with explicit environmental justice policies implemented into its General Plan.

City of Stockton 2040 General Plan

Pursuant to Senate Bill 1000, the City of Stockton's 2040 General Plan contains several policies and actions which are aimed to address environmental justice. Of these, Policy CH-2.1 prioritizes maintenance of streets and improvement of sidewalks, parks, and other infrastructure in areas of the city that historically have been comparatively underserved by public facilities. Actions under Policy CH-2.1 include (City of Stockton 2018):

- **Action CH-2.1A**: When considering parks and infrastructure maintenance and improvement projects, consider the following through an open and engaging process inclusive of community residents:
  - Whether the affected community is underserved or disadvantaged
  - What the priority needs of the community are and whether the project would address those needs
  - Whether the project would negatively impact the community, such as through increased exposure to pollutants or displacement of residents or local businesses
- **Action CH-2.1B:** Provide incentives for rehabilitation or redevelopment of distressed properties that takes into consideration strategies to avoid gentrification
- **Action CH-2.1C:** Develop incentives to promote reuse of distressed areas, such as through re-zoning, permit streamlining, density bonuses, and other appropriate tools.
- **Action CH-2.1D:** Conduct marketing to potential developers to encourage the redevelopment and conversion of distressed commercial strips into housing and mixed-use area that include strategies to avoid gentrification
- **Action CH-2.1E:** Investigate and implement programs that will incentive landlords to maintain properties free of Municipal Code violations and criminal activity
- **Action CH-2.1F:** Work with transit agencies, non-profit organizations, and communities to maintain and improve transit service in underserved and disadvantaged neighborhoods to connect residents with jobs, shopping, and services.

4.7.3 Impact Analysis

a. Methodology and Significance Thresholds

Under CEQA, a significant impact is defined as "a substantial or potentially substantial adverse change in the environment" (CEQA Section 21068). For determining the significance of environmental justice impacts, the analysis focuses on whether environmental benefits and burdens

are distributed generally equally across the region's EJ and non-EJ communities, or if EJ communities bear substantially greater environmental burdens or benefit substantially less than non-EJ communities.

To evaluate whether EJ communities would disproportionately bear the impacts of the transportation system resulting from the 2022 RTP/SCS, the following performance measure were used across the region's population to evaluate whether EJ communities would benefit proportionally from the benefits of the 2022 RTP/SCS transportation improvements. The following performance measures were analyzed:

- Percentage of EJ households versus non-EJ households within 500 feet of a major transportation corridor.
- Percentage of EJ households versus non-EJ households within a half-mile of transit
- Percentage of EJ households versus non-EJ households within a half-mile of employment

In addition, the diversity of the housing stock was evaluated to assess the effects of the 2022 RTP/SCS on the provision of diverse housing types. The provision of more affordable housing types is an important issue in considering impacts to EJ communities because lack of housing can lead to displacement of existing EJ communities, typically to areas with poorer environmental conditions. The 2022 RTP/SCS would have a significant EJ impact if the plan would lower the availability of more affordable housing types.

EJ is not a resource area included in Appendix G of the *State CEQA Guidelines*. For the purposes of this Program EIR, SJCOG has determined that significant impacts to EJ communities would occur if the 2022 RTP/SCS would:

1. Result in disproportionately high or adverse environmental impacts to EJ communities;
2. Result in disproportionately lower distribution of benefits derived from the proposed transportation improvement projects to EJ communities; or
3. Result in decreased availability of affordable housing stock.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with projects contained within the 2022 RTP/SCS. a Section 4.7.2.c summarizes the impacts associated with capital improvement projects proposed in the 2022 RTP/SCS. Due to the programmatic nature of the 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1: Disproportionately high or adverse environmental impacts to EJ communities

Impact EJ-1 THE PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD NOT RESULT IN ADVERSE IMPACTS TO EJ HOUSEHOLDS. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

Short-Term Impacts

During construction of some transportation improvement projects and the development of the land use scenario envisioned in the proposed 2022 RTP/SCS, some minority and/or low-income populations may experience impacts. Improvement projects included in the proposed 2022 RTP/SCS may have short-term impacts on surrounding communities related to construction, including impacts related to air quality, noise, and traffic (refer to Sections 4.3, *Air Quality*, 4.13, *Noise*, and 4.14 *Transportation,* respectively). Specific air quality impacts could include exposure to dust and diesel particulate matter (DPM) due to the operation of construction vehicles (i.e., scrapers, loaders, dump trucks), and clearing and grading activities. Other air quality impacts include short term exposure to hazardous air emissions, such as diesel emissions from construction equipment. Construction noise impacts from the use of heavy equipment at construction sites could expose nearby receptors to levels up to 101 decibels at 50 feet from the source, as discussed in Section 4.13, *Noise*. Temporary traffic impacts include delays during road closures or other disturbances from construction activities could occur from implementation of the proposed 2022 RTP/SCS.

According to SJCOG, the majority of EJ communities are primarily concentrated within the city of Stockton, Lodi, and adjacent to Lathrop and Manteca (SJCOG 2022a). Proposed transportation projects and land use development envisioned by the 2022 RTP/SCS would take place in these communities. However, future land use and transportation projects would not solely be placed within identified EJ communities. Transportation projects, including roadway widenings, roadway extensions, roadway replacement, and railroad crossings would occur in areas that are not identified as EJ communities. These projects are present in unincorporated San Joaquin County, as well as within incorporated cities such as Lathrop, Manteca, Tracy, and Lodi. Therefore, transportation projects would occur throughout the region. As such, short-term construction impacts would not disproportionately effect EJ populations. Short-term impacts would be less than significant.

Long-Term Impacts

Proximity to major transportation corridors can increase a population's exposure to high levels of noise, as well as air contaminants, such as DPM from diesel exhaust and re-entrained road dust caused by moving vehicles. Environmental justice populations are usually located closer to freeways and could be adversely impacted by the proposed 2022 RTP/SCS if it would increase the percentage of the EJ population within 500 feet of a major transportation corridor, as compared to the non-EJ population, relative to existing conditions.

Under existing conditions, 5.3 percent of households in EJ communities are within 500 feet of a freeway, compared to 5.4 percent in non-EJ communities. At 2046 with proposed project conditions, 6.1 percent of households in EJ communities would be within 500 feet of a freeway, compared to 5.7 percent non-EJ communities. This is the result of the proposed 2022 RTP/SCS focusing on infill and redevelopment of existing property which tends to be within or near an urban core where there is a higher density of freeways. Although the proposed 2022 RTP/SCS would result

in an increased percentage of households in EJ communities within 500 feet of a freeway, it would increase for non-EJ communities as well. In addition, the projected increase, less than one percent for both EJ and non-EJ households, would not account for a disproportionately high impact to EJ communities. Therefore, the proposed 2022 RTP/SCS would not be disproportionately or adversely affect EJ communities. This impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 2:	Disproportionately lower distribution of benefits derived from the proposed transportation improvement projects to EJ communities

Impact EJ-2 THE PROPOSED TRANSPORTATION IMPROVEMENTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD NOT RESULT IN A DISPROPORTIONATELY LOWER DISTRIBUTION OF BENEFITS TO EJ COMMUNITIES. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

For populations with limited financial, physical or other means, convenient access to transit is critical due to the lower likelihood of these populations having access to a vehicle. The transportation portfolio selected under the proposed 2022 RTP/SCS would maintain a medium level of transit investment, similar to existing conditions. Table 4.7-3 illustrates how transit improvements are distributed among the EJ and non-EJ population under existing conditions and 2046 conditions with implementation of the proposed 2022 RTP/SCS. The table includes two metrics: the percentage of EJ and non-EJ households located within 0.5-mile of transit, and the percentage of EJ and non-EJ households located within 0.5-mile of employment.

Table 4.7-3 Percentage of Households within One-Half Mile of Transit and Employment

	Percent EJ Households| Percent Non-EJ Households	
Metric	**2016**	**2046 with 2022 RTP/SCS**
Households located within 0.5-mile of transit	18.9|4.6	23.9|4.2
Employment located within 0.5-mile of transit	29.9|12.9	30.1|11.1

Source: SJCOG 2022b

As shown in Table 4.7-3, the proposed 2022 RTP/SCS would increase the proportion of EJ households located within 0.5-mile of transit and 0.5-mile of employment relative to existing conditions. As such, the 2022 RTP/SCS would distribute benefits derived from the proposed transportation improvement projects to EJ communities. Therefore, impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 3: Decreased availability of affordable housing stock

Impact EJ-3 IMPLEMENTATION OF THE LAND USE SCENARIO ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD INCREASE THE AVAILABILITY OF AFFORDABLE HOUSING STOCK. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

The provision of affordable housing is an important issue in considering impacts to EJ communities because lack of housing can lead to displacement of existing EJ communities, typically to areas with poorer environmental conditions. Providing a greater mix of housing types allows for a greater range of options for all populations, including the EJ population, and also provides for a greater range of housing affordability. Typically, multifamily housing provides more a more affordable option relative to single family housing.

Table 4.7-4 provides the composition of SJCOG's housing stock under baseline and 2046 with proposed 2022 RTP/SCS conditions. As indicated in the table, the diversity of the housing stock would increase, with a greater percentage of multi-family housing available in 2046 under proposed 2022 RTP/SCS conditions.

Table 4.7-4 Composition of Housing Stock in Identified EJ Areas

	Percent of Housing Stock	
Housing Type	**2016**	**2046 with 2022 RTP/SCS**
Single Family	69	60
Multifamily/Mobile Homes/Other	31	40

Source: SJCOG 2022b

Additionally, under the proposed 2022 RTP/SCS, 37 percent of new dwelling units would be provided at 20+ units per acre (SJCOG 2022b). Furthermore, the proposed 2022 RTP/SCS would provide housing within identified EJ areas. The CFHTF identifies Highest Resource and High Resource areas within and immediately surrounding the cities of Tracy, Manteca, Lathrop, Lodi, and Stockton (CFHTF 2022). Under the proposed 2022 RTP/SCS, 67 percent of new households would be developed in areas identified as Highest Resource or High Resource (SJCOG 2022b). As noted in CFHTF methodology, the Highest Resource and High Resource areas would qualify under the 9 percent Federal Low-Income Housing Tax Credit Program which provides a reduction in federal tax liability to investors partnering with project sponsors in the development of qualified low-income housing (CFHTF 2021). Therefore, implementation of the proposed 2022 RTP/SCS would not decrease the diversity of the housing stock, but rather improve housing diversity and affordability. This impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

c. Proposed 2022 RTP/SCS Projects That May Result in Impacts

Table 4.7-5 identifies proposed 2022 RTP/SCS projects that may result in impacts to environmental justice communities. Given the large number of projects envisioned across the SJCOG region in the proposed 2022 RTP/SCS, the table shows a representative rather than comprehensive list of projects. Listed projects that would generate these impacts are representative of the types of impacts and the types of projects that could be affected in different localities.

Table 4.7-5 Specific 2022 RTP/SCS Projects that May Result in Impacts

Agency	Project Location	Project Scope	Impact
City of Lodi	SR-99 at Harney Lane	Reconstruct interchange to provide 6 through lanes on SR 99, 4 lanes on Harney between Reynolds Ranch Pkwy and SR 99 and modify on-ramps and off-ramps	EJ-1
City of Lodi	SR-99 at Turner Road	Reconstruct interchange to provide operational and safety improvements on SR 99 at Turner Road (PM 31.3/31.6)	EJ-1
City of Manteca	Airport Way SR-120 to Yosemite Avenue	Widen from 2 to 4 lanes	EJ-1
City of Manteca	Airport Way Lathrop Road to Roth Road	Widen from 2 to 4 lanes	EJ-1
City of Stockton	Airport Way	Intersection and operational improvement	EJ-1
City of Stockton	French Camp Road	Widen from 2 to 6 lanes	EJ-1
City of Stockton	I-5 at Otto Drive	Construction of a new interchange and auxiliary lanes (PM 33.3/34.2)	EJ-1
San Joaquin County	Howard Road	Passing lanes and channelization	EJ-1

4.7.4 Cumulative Analysis

The cumulative impact analysis area for environmental justice consists of the SJCOG region and adjoining counties. Information regarding these adjoining counties can be found in Section 3, *Setting*. Future development in this region that could impact environmental justice communities is considered in this analysis. This cumulative extent is used to evaluate potential direct and indirect, permanent, and temporary impacts from disproportionately causing more environmental impacts in environmental justice communities, lowering the benefit of projects for environmental justice communities, or decreasing affordable housing stock within the context of the cumulative impact analysis area.

Growth and development in adjoining counties would be developed in accordance with applicable General Plans, RTP/SCS programs, and other planning documents across the cumulative impact area. As such, any proposed growth and development would be required to comply with goals, policies, and programs adopted for the purpose of avoiding or mitigating environmental effects, including those that pertain specifically to EJ communities. However, as applicable planning documents across the cumulative impact area focus efforts to encourage transit-oriented infill development pursuant to State GHG reduction goals, a greater proportion of residential development, particularly high-density, low-income residential development, would be placed near transit corridors and exposed to environmental effects associated with living near a transportation

corridor. Therefore, cumulative impacts related to environmental justice communities would be significant.

As previously discussed in Impact EJ-1, the proposed 2022 RTP/SCS would not result in significant and unavoidable impacts to EJ communities with regards to disproportionately high adverse effects to EJ communities as a result of closer proximity to transportation corridors. The proposed 2022 RTP/SCS would prioritize transit-oriented infill development which would result in a minor increase of both EJ and non-EJ housing located near transportation corridors. As such, EJ housing would not be disproportionately exposed to adverse environmental effects associated with living near a transportation corridor. Therefore, the contribution of the proposed 2022 RTP/SCS to cumulative EJ impacts would not be cumulatively considerable.

4.8 Geology and Soils

This section evaluates impacts on geology and soils and paleontological resources from implementation of the proposed 2022 RTP/SCS.

4.8.1 Setting

a. Regional Geology

San Joaquin County includes parts of two of the eleven geomorphic provinces of California: The Great Central Valley and Coast Ranges (California Geological Survey 2002). The Great Central Valley, which covers the majority of San Joaquin County except for the southwestern corner, is an asymmetrical synclinal trough, approximately 50 miles wide and 400 miles long. The region is an unusual lowland in that sediments within the basin are relatively undeformed, while the surrounding rock units are highly deformed. Little geologic variation exists within the Great Central Valley, with surficial deposits consisting primarily of unconsolidated Quaternary sediments. The Great Central Valley is bordered on the east by the west sloping Sierran bedrock surface, which continues westward beneath alluvium and older sediments. The Western border is underlain by east-dipping Cretaceous and Cenozoic strata that form a deeply buried synclinal trough. The San Joaquin Valley comprises the southern portion of the Great Central Valley, whereas the Sacramento Valley is present in the northern portion. Oil fields follow anticlinal uplifts that mark the southwestern border of the San Joaquin Valley and its southernmost basin. The Sacramento Valley plain is interrupted by the Marysville Buttes, an isolated Pliocene volcanic plug approximately 2,000 feet high. There are no active faults located within the SJCOG region but there are potentially active Quaternary faults which transect the southwestern area of the SJCOG region (Figure 4.8-1). Existing geologic, soils, and flooding conditions are briefly summarized below.

b. Local Geology

San Joaquin County consists of 10 geologic units mapped on the Geologic Map of California (Jennings 2010) including; (1) Quaternary (Pleistocene to Holocene) marine and nonmarine sedimentary rock (Q), (2) Quaternary (Pleistocene) marine and nonmarine sedimentary rocks (Qoa), (3) Tertiary to Quaternary (Pliocene to Pleistocene) nonmarine sedimentary rock (QPc), (4) Tertiary (Miocene) marine sedimentary rocks (M), (5) Tertiary (Miocene) nonmarine sedimentary rock (Mc), (6) Tertiary (Eocene) marine sedimentary rocks (E), (7) Tertiary (Paleocene) marine sedimentary rock (Ep), (8) Upper Cretaceous marine sedimentary and metasedimentary rock (Ku), (9) Cretaceous to Jurassic marine sedimentary and metasedimentary rock (KJf), (10) Cretaceous to Jurassic marine sedimentary and metasedimentary rocks (KJf_m).

San Joaquin County is located at the northern end of the San Joaquin Valley, a sedimentary basin filled with an up to six-mile-thick sequence of interbedded clay, silt, sand, and gravel deposits ranging in age from more than 144 million years old to less than 10,000 years. Recent sediments consist of coarse-grained sand and gravel deposits along river courses and fine-grained alluvium consisting of silt and clay deposited in low-lying areas or flood basins. The southwestern corner of San Joaquin County contains part of the Diablo Mountains. The foothills of the Diablo Mountains contain older sedimentary rocks of Pliocene or Pleistocene age (QPc) (Figure 4.8-2). Older rocks are exposed further to the southwest into the main range. Within San Joaquin County, rocks of Neogene (M), Paleogene (E and Ep), Cretaceous (Ku), and Cretaceous-Jurassic (KJf and KJfm) age are exposed. These are primarily sedimentary units, but parts of the Mesozoic (Ku, KJf, and KJfm) units are slightly

metamorphosed (metasedimentary). Mesozoic plutonic (um) and metavolcanic (Mzv) rocks have been reported in nearby areas of the Diablo Mountains but not within San Joaquin County.

The northeastern part of San Joaquin County contains foothills of the Sierra Nevada. Older Quaternary alluvial sediments (Qoa) and Plio-Pleistocene sedimentary rocks (QPc) are found here. The northeastern edge of San Joaquin County contains units mapped as terrestrial Miocene sedimentary rocks (Mc). Exposures of older (Paleogene, Mesozoic, and Paleozoic) sedimentary and plutonic rocks are found deeper within the Sierra Nevada, west of San Joaquin County. Table 4.8-1 summarizes the paleontological sensitivities of each geologic unit.

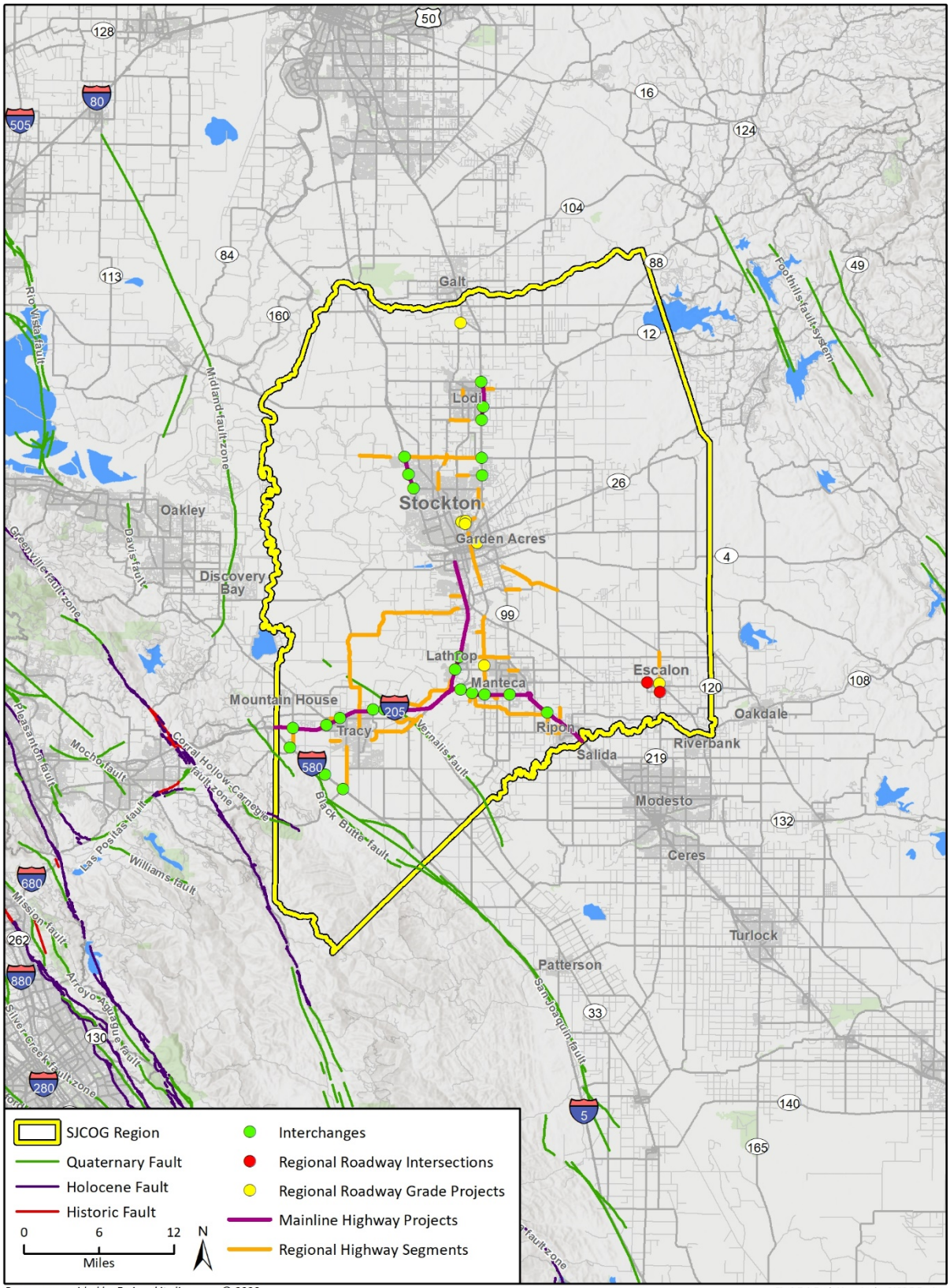
Table 4.8-1 Paleontological Sensitivity of Geologic Units in the Project Area

Geologic Unit	Abbreviation	Paleontological Sensitivity
Quaternary (Pleistocene-Holocene) marine and nonmarine (continental) sedimentary rocks	Q	Low at surface; increase to high with depth
Quaternary (Pleistocene) marine and nonmarine (continental) sedimentary rocks	Qoa	High
Quaternary-Pliocene (Pliocene-Pleistocene) nonmarine (continental) sedimentary rocks	QPc	High
Miocene marine sedimentary rocks	M	High
Miocene nonmarine (continental) sedimentary rocks	Mc	High
Eocene marine sedimentary rocks	E	Low
Paleocene marine sedimentary rocks	Ep	Low
Upper Cretaceous marine sedimentary and metasedimentary rocks	Ku	High
Cretaceous-Jurassic marine sedimentary and metasedimentary rocks	KJf and KJfm	High

Earthquake Ground-Shaking and Fault Rupture

According to the San Joaquin County 2035 General Plan EIR, there are no active faults located within the SJCOG region (Figure 4.8-1). Instead, there are potentially active Quaternary faults which transect the southwestern area of the SJCOG region, including the Black Butte Fault which lies directly adjacent to Interstate 580 and the Vernalis Fault approximately 3.9 miles east of the City of Tracy. Additionally, the SJCOG region is located between two areas of seismic activity (San Joaquin County 2014). To the west there are active faults associated with the San Andreas Fault System, with the Marsh Creek-Greenville fault located approximately one mile west of the southern tip of the SJCOG region. The Marsh Creek-Greenville fault is capable of producing a maximum moment magnitude earthquake of 6.9 on the Richter Scale, and most recently triggered a magnitude 5.6 earthquake in 1980. Other active faults associated with the San Andreas Fault System include the Concord (25 miles northeast), Calaveras (15 miles southwest), Hayward (18 miles southwest), and the San Andreas (35 mile southwest) faults. To the east of the SJCOG region there is a regional shear zone associated with the Sierra Nevada foothills known as the Foothills Fault System, located approximately 10 miles east and thought capable of producing a maximum moment magnitude earthquake of 6.5 on the Richter scale, but has not been classified as active. It is expected that ground-shaking from a major earthquake could produce a range of ground-shaking intensities that could affect the SJCOG region (San Joaquin County 2014).

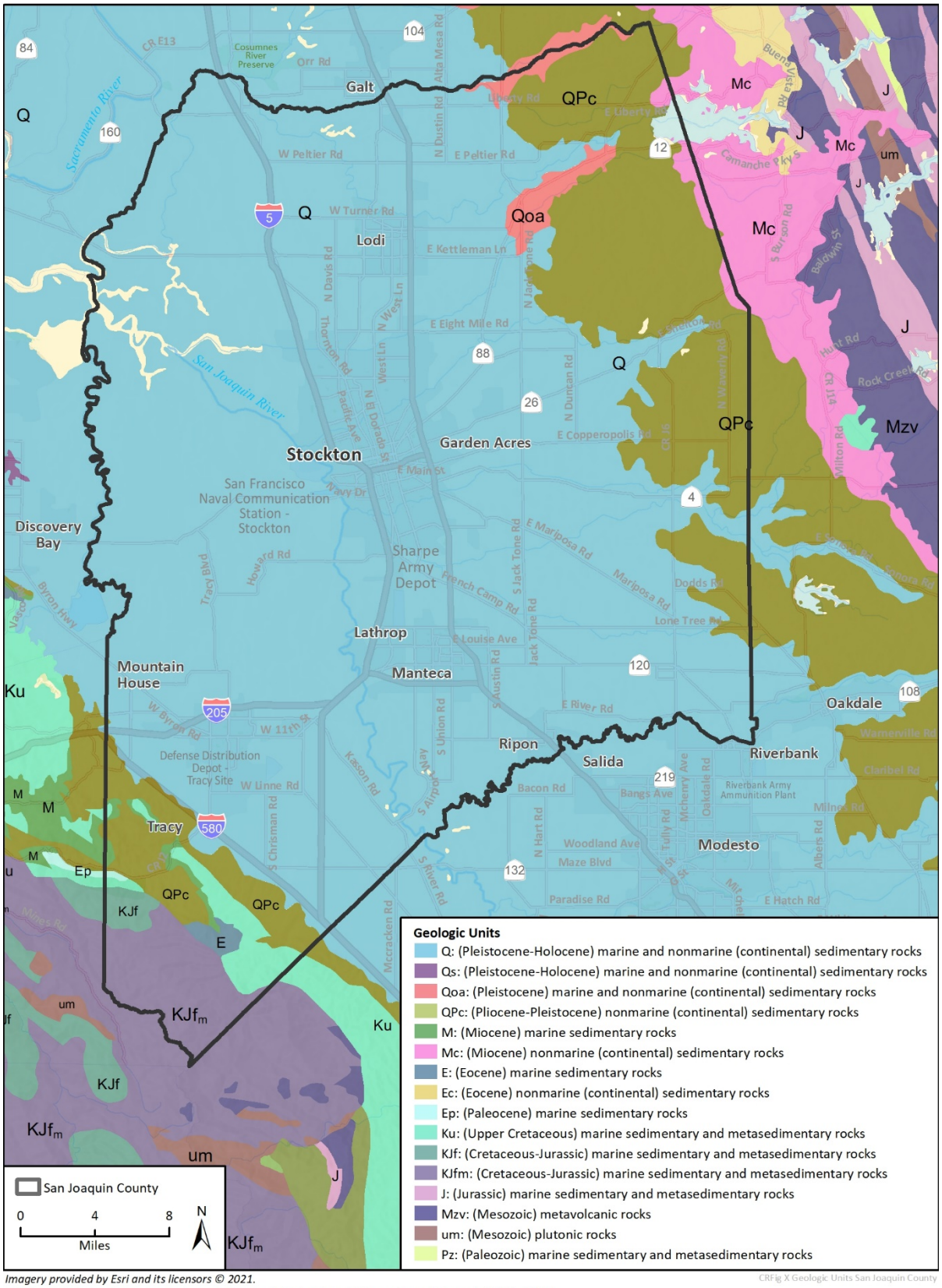
Figure 4.8-1 Fault Lines in the SJCOG Planning Area



Basemap provided by Esri and its licensors © 2022.
Fault Line data provided by USGS, 2017.

Fig 4.7-1 Fault Lines in the SJCOG Region

Figure 4.8-2 Geologic Units in the SJCOG Region



Imagery provided by Esri and its licensors © 2021.
Additional data provided by Geologic map of California by Jennings, Gutierrez, Bryant, Saucedo & Wills, 2010.

Liquefaction and Lateral Spreading

Liquefaction, or the loss of soil bearing strength during a strong earthquake, is a potential occurrence in several areas with younger soils as well as in areas where the groundwater table is less than 50 feet deep. Specifically, in areas of loose sand and silt that is saturated with water, soils can behave like liquid during earthquakes. In addition to necessary soil conditions, ground acceleration and duration of the earthquake must be of sufficient energy to induce liquefaction. No generalized liquefaction mapping has been completed for the SJCOG region (San Joaquin County 2014), but mapped liquefaction zones exist immediately west of the SJCOG region within the County of Contra Costa and northwest in Solano County (California Geological Survey [CGS] 2022). Thus, any potential liquefaction susceptibility would likely occur within the western portion of the SJCOG region (San Joaquin County 2014). According to the General Plans of Lathrop and Manteca, liquefaction is found within their respective planning areas (City of Lathrop 1991; City of Manteca 2003). The most serious liquefaction threat lies in the Delta, with many levees directly underlain by relatively clean, water saturated sands and peats. Strong ground shaking could cause liquefaction under these levees and lead to localized flooding (San Joaquin County 2014).

Slope Stability

Landslides and surficial slope failures are most likely to occur in areas of greater than 25 percent slope (hillside areas) and along steep bluffs. Landslides also occur due to specific events, such as loss of vegetation after fires or earthquakes adding loads to barely stable slopes. Steep slopes within the SJCOG region are relatively limited and primarily found in the southwestern portion of San Joaquin County, along with smaller slopes susceptible to instability located throughout the Delta area's levee system (San Joaquin County 2014).

Expansive Soils

Soils with relatively high clay content are expansive due to the capacity of clay minerals to take in water and swell (expand) to greater volumes. Expansive soils are present throughout the SJCOG region, primarily near its western boundary as well as its central portion, near Stockton, and some eastern portions. Soils within the southwestern end of the SJCOG region have been mapped with high shrink-swell potential (San Joaquin County 2014). As noted in the San Joaquin County General Plan, close to half of the upper five feet of soils throughout the county have a low shrink-swell potential (San Joaquin County 2014).

Subsidence

Subsidence is a gradual settling or sudden sinking of the Earth's surface due to removal or displacement of subsurface earth materials. Principal causes include aquifer-system compaction associated with groundwater withdrawals; drainage of organic soils; underground mining; or natural compaction or collapse, such as with sinkholes or thawing permafrost (USGS 2022). The loss of peat soils, due to compaction and mining, has caused land within the Delta portion of the SJCOG region to subside. This subsidence has resulted in the Delta being, on average, approximately 15 feet below sea level, with some areas approximately 25 feet below sea level (San Joaquin County 2014).

c. Paleontological Resources

Paleontological resources, or fossils, are the evidence of once-living organisms preserved in the rock record. They include both the fossilized remains of ancient plants and animals and the traces

thereof (e.g., trackways, imprints, burrows, etc.). Paleontological resources are not found in "soil" but are contained within the geologic deposits or bedrock that underlies the soil layer. Typically, fossils are greater than 5,000 years old (i.e., older than middle Holocene in age) and are typically preserved in sedimentary rocks. Although rare, fossils can also be preserved in volcanic rocks and low-grade metamorphic rocks under certain conditions (Society of Vertebrate Paleontology [SVP] 2010). Fossils occur in a non-continuous and often unpredictable distribution within some sedimentary units, and the potential for fossils to occur within sedimentary units depends on several factors. It is possible to evaluate the potential for geologic units to contain scientifically important paleontological resources, and therefore evaluate the potential for impacts to those resources and provide mitigation for paleontological resources if they are discovered during construction of a project.

Paleontological sensitivity refers to the potential for a geologic unit to produce scientifically significant fossils. Direct impacts to paleontological resources occur when earthwork activities, such as grading or trenching, cut into the geologic deposits within which fossils are buried and physically destroy the fossils. Since fossils are the remains of prehistoric animal and plant life, they are considered to be nonrenewable. Such impacts have the potential to be significant and, under the *CEQA Guidelines*, may require mitigation. Sensitivity is determined by rock type, past history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey. Vertebrate fossils are almost always significant because they occur more rarely than invertebrates or plants. Thus, geological units having the potential to contain vertebrate fossils are considered the most sensitive

The SVP outlines in its Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources (2010) guidelines for categorizing paleontological sensitivity of geologic units within a project area. The SVP (2010) describes sedimentary rock units as having a high, low, undetermined, or no potential for containing significant nonrenewable paleontological resources. This criterion is based on rock units within which vertebrates or significant invertebrate fossils have been determined by previous studies to be present or likely to be present.

The geographic distribution, general characteristics, and paleontological sensitivities of each geologic unit in the SJCOG region is discussed below. Figure 4.8-2 summarizes the paleontological sensitivities of each geologic unit.

Quaternary (Pleistocene-Holocene) marine and nonmarine (continental) sedimentary rocks (Q)

Sediments of Holocene age are generally too young (i.3., <5000 years before present) to preserve paleontologically significant resources (SVP 2010). Although Figure 4.8-2 (based on Jennings et al. 2010) depicts much of the center of San Joaquin County as the undifferentiated Q unit, Wahrhaftig et al. (1993) recognized differentiated Quaternary gravel, sand, and silt alluvial units of Holocene to early Pleistocene age in the County. These deposits are referred to the Modesto, Riverbank, and Turlock Lake formations. The UCMP records 18 Pleistocene fossil localities in San Joaquin County (UCMP 2021). Three of the localities are from the Modesto Formation, but the unit of origin for the other 15 is unreported making it impossible to tell whether the localities originate from units depicted as Q, Qoa, or QPc in Figure 4.8-2. Taxa reported from the localities include horses (*Equus*), camels (*Camelops*), mammoths (*Mammuthus*) and ground sloths (*Megalonyx*) (Jefferson 2010). Overall, the sediments mapped as Quaternary marine and nonmarine (continental) sedimentary rocks (Q) in San Joaquin County have a **low sensitivity at the surface and increases to high with**

depth. If more precise maps are used to differentiate among Pleistocene and Holocene sediments, Pleistocene units would have a high paleontological sensitivity. In this case, Holocene units would have a low paleontological sensitivity that increases with depth, because although they are not old enough to bear fossils themselves, the sediments likely grade into Pleistocene sediments below ground.

Quaternary (Pleistocene) marine and nonmarine (continental) sedimentary rocks (Qoa)

The lithology and paleontological sensitivity of Qoa is identical to the Pleistocene-aged sections of the areas mapped as Q described above except that they are of confirmed Pleistocene age. Therefore, areas mapped as Qoa have a **high paleontological sensitivity.**

Quaternary-Pliocene (Pliocene-Pleistocene) nonmarine (continental) sedimentary rocks (QPc)

Areas mapped as QPc in southwestern San Joaquin County consist of the Oro Loma Formation per the map Dibblee and Minch (2006). There are no reported vertebrate fossil localities from this unit. Plio-Pleistocene units in northeastern San Joaquin County include the North Merced Gravel and Laguna Formation (Dawson 2009; Gutierrez & Holland 2018). Neither of the units are known to be fossiliferous. Given that areas mapped as QPc include Pleistocene units, these areas may cover the Turlock Lake, Modesto, or Riverbank formations as well. As stated above, these units are known to be fossiliferous. UCMP (2021) reports two Pliocene-aged fossil localities from San Joaquin County both bearing horse (*Equus*) remains. One locality is from an unnamed unit, whereas the other is reportedly from the marine San Joaquin Formation. Given that the areas mapped as QPc include Pleistocene units known to be fossiliferous and Pliocene-aged vertebrate fossils have been found in San Joaquin County, areas mapped as QPc have a **high paleontological sensitivity.**

Miocene marine sedimentary rocks (M)

The Miocene marine sedimentary unit consist of the Neroly Formation and Briones (or Cierbo) Sandstone preserving marine and marginal marine paleoenvironments (Dibblee & Minch 2006). These units are often referred to collectively as the San Pablo group, but other, often older, sources group the units as the San Pablo Formation. The UCMP reports 35 localities from the Neroly and "San Pablo" formations. Despite the marine or marginal marine nature of the rocks, their fossil content is primarily terrestrial mammals, such as horses (*Nannippus* and *Hipparion*), pronghorn (*Capromeryx*), canids (*Borophagus* [=*Osteoborus*]), elephants (*Gomphotherium*), and rodents (Paleobiology Database [PBDB] 2021; UCMP 2021). Additional fossil localities from the same units occur in Alameda, Contra Costa, and Stanislaus Counties. Given their prolific history of producing vertebrate fossils, the Miocene marine sedimentary units are assigned a **high paleontological sensitivity.**

Miocene nonmarine (continental) sedimentary rocks (Mc)

The Miocene nonmarine sedimentary unit consist of the Mehrten and Valley Springs formations (Dawson 2009; Gutierrez & Holland 2018). The late Miocene Mehrten Formation is highly fossiliferous. UCMP reports one locality within San Joaquin County, but 42 others are reported from Merced, Stanislaus, and Tuolumne Counties. The localities preserve mammals (horses, cats, elephants, and camels), reptiles (turtles), and fish (PBDB 2021; UCMP 2021). No fossil localities have yet been reported from the Valley Spring Formation. Due to the fossiliferous nature of the Mehrten

Formation within and outside of San Joaquin County, areas mapped as Mc are assigned a **high paleontological sensitivity.**

Eocene marine sedimentary rocks (E)

The Eocene marine sedimentary unit outcrops within the Diablo Range in southwestern San Joaquin County consist of the Tesla Formation (Dibblee & Minch 2006b). The Tesla Formation has produced invertebrate (mollusk) fossils within San Joaquin County, but no vertebrate material has been reported (PBDB 2021; UCMP 2021). The marine sedimentary rocks have a **low paleontological sensitivity**.

Paleocene marine sedimentary rocks (Ep)

The mapped Paleocene marine sedimentary units also represent the Tesla Formation. Although Dibblee & Minch (2006a) recognize the entire Tesla Formation as Eocene in age, the location of the outcrops and lack of any Paleocene units in the interpretation of Dibblee & Minch (2006a) show that this is the correct unit. Units designated E in Figure 4.8-2, have a **low paleontological sensitivity.**

Upper Cretaceous marine sedimentary and metasedimentary rocks (Ku)

The Upper Cretaceous marine sedimentary and metasedimentary units include outcrops of the Moreno and Panoche formations (Dibblee & Minch 2006a, b). The Panoche Formation produces abundant invertebrate (mollusk, arthropod, and echinoderm) throughout the Diablo Range, including San Joaquin County (PBDB 2021; UCMP 2021). However, vertebrate remains are much rarer. Fragmentary bony fish, shark, and marine reptile fossils have been recovered from less than five localities in the Panoche Formation in Contra Costa, Merced, and Stanislaus Counties. The Moreno Formation has produced more than 100 vertebrate fossil localities (PBDB 2021; UCMP 2021). Taxa include marine reptiles (mosasaurs, plesiosaurs, and turtles), bony fish, and sharks, but some of California's few non-avian dinosaur fossils (hadrosaurs) come from the Moreno Formation (Bell & Evans 2010). All vertebrate-bearing localities from the Moreno Formation come from Fresno and Stanislaus Counties, but there are invertebrate (mollusk) fossils reported from San Joaquin and Contra Costa Counties as well, demonstrating that this unit is fossiliferous throughout. Due to the fossil-bearing potential of the Upper Cretaceous marine sedimentary and metasedimentary rocks, particularly the Moreno Formation, has a **high paleontological sensitivity.**

Cretaceous-Jurassic marine sedimentary and metasedimentary rocks (KJf and KJfm)

Both Cretaceous-Jurassic marine sedimentary and metasedimentary units mapped in Figure 4.8-2 represent the Franciscan Complex differing only in that in areas labeled KJfm consist of fragmented and sheared rather than bedded Franciscan rocks (Jennings et al. 2010). Two marine reptile specimens have been recovered from the Franciscan Complex (PBDB 2021; UCMP 2021). One of the specimens, an ichthyosaur, comes from San Joaquin County (Camp 1941). The other, a plesiosaur, comes from San Luis Obispo County. Invertebrate-bearing localities from the Franciscan Complex are reported throughout the Coast Ranges of central California. The Cretaceous-Jurassic marine sedimentary and metasedimentary rocks have a **high paleontological sensitivity.**

4.8.2 Regulatory Setting

a. Federal Laws, Regulations, and Policies

Earthquake Hazards Reduction Act

The Earthquake Hazards Reduction Act was enacted in 1977 to "reduce the risks to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards and reduction program." To accomplish this, the act established the National Earthquake Hazard Reduction Program (NEHRP). NEHRP's mission includes improved understanding and characterization of hazards and vulnerabilities, improvement of building codes and land use practices, risk reduction through post-earthquake investigations and education, development and improvement of design and construction techniques, improvement of mitigation capacity, development of alternative performance objectives to advance functional recovery, and accelerated application of research results. The NEHRP designates the National Institute of Standards and Technology as the lead agency of the program and assigns it several planning, coordinating, and reporting responsibilities. Programs under the NEHRP help inform and guide planning and building code requirements, such as emergency preparedness responsibilities and seismic code standards.

Disaster Recovery Reform Act of 2018

The Disaster Recovery Reform Act was signed into law in 2018. The reforms acknowledge the shared responsibility for disaster response and recovery, are intended to reduce the complexity of the Federal Emergency Management Agency (FEMA) and build the nation's capacity for the next catastrophic event. The law, which amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act, contains 56 distinct provisions that require FEMA policy or regulation changes for full implementation. Examples of the provisions include expanding eligible hazard mitigation activities including the replacement of electric utility poles resilient to extreme winds (Section 1204) and earthquake early warning technology (Section 1233).

Archaeological and Paleontological Salvage (23 USC 305)

Statute 23 United States Code (USC) 305 amends the Antiquities Act of 1906. Specifically, it states:

> Funds authorized to be appropriated to carry out this title to the extent approved as necessary, by the highway department of any State, may be used for archaeological and paleontological salvage in that state in compliance with the Act entitled "An Act for the preservation of American Antiquities," approved June 8, 1906 (Public Law [PL] 59-209; 16 USC 431-433), and State laws where applicable.

This statute allows funding for mitigation of paleontological resources recovered pursuant to federal aid highway projects, provided that "excavated objects and information are to be used for public purposes without private gain to any individual or organization" (Federal Register [FR] 46(19): 9570).

Paleontological Preservation Act

The Paleontological Resources Preservation Act (PRPA) was signed into law in 2009. It directs the Department of Agriculture and the Department of the Interior to implement comprehensive paleontological resource management programs on federal lands. The PRPA protects scientifically

significant fossils on federal lands and provides a permitting system where researchers can collect and study scientifically significant fossils which will remain in the public trust. The act also allows for the collection of common plant and invertebrate fossils for personal, non-commercial use on federal lands. The PRPA requires the Secretaries of the Interior and Agriculture to manage and protect paleontological resources on federal land. The PRPA furthers the protection of fossils on federal lands by criminalizing the unauthorized removal of fossils.

b. State Laws, Regulations, and Policies

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act, California's Alquist-Priolo Act (PRC 2621 et seq.), is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy across the traces of active faults and strictly regulates construction in the corridors along active faults (Earthquake Fault Zones). It also defines criteria for identifying active faults, giving legal weight to terms such as "active," and establishes a process for reviewing building proposals in and adjacent to Earthquake Fault Zones. Under the Alquist-Priolo Act, faults are zoned, and construction along or across them is strictly regulated if they are "sufficiently active" and "well-defined." A fault is considered sufficiently active if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined as within the last 11,000 years). A fault is considered well-defined if its trace can be clearly identified by a trained geologist at the ground surface or in the shallow subsurface, using standard professional techniques, criteria and judgment.

Seismic Hazards Mapping Act of 1990

Like the Alquist-Priolo Act, the Seismic Hazards Mapping Act of 1990 (PRC 2690–2699.6) is intended to reduce damage resulting from earthquakes. While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong ground-shaking, liquefaction and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act: the State is charged with identifying and mapping areas at risk of strong ground-shaking, liquefaction, landslides and other corollary hazards, and cities and counties are required to regulate development within mapped Seismic Hazard Zones.

California Building Standards Code

The California Building Code (CBC) appear in the CCR as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety, and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. The 2019 CBC is based on the 2018 IBC published by the International Code Council. In addition, the CBC contains necessary California amendments, which are based on reference standards obtained from various technical committees and organizations, such as the American Society of Civil Engineers (ASCE), the American Institute of Steel Construction, and the American Concrete Institute. ASCE Minimum Design Standard 7-05 (ASCE 7-05) provides requirements for general structural design and includes means for determining earthquake loads, as well as other loads (e.g., flood, snow, wind), for inclusion into building codes. The provisions of the CBC apply to the construction, alteration,

movement, replacement, and demolition of every building or structure, or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements consider the occupancy category of the structure, site class, soil classifications, and various seismic coefficients that are used to determine a Seismic Design Category (SDC) for a project as described in Chapter 16 of the CBC. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E (very high seismic vulnerability and near a major fault) and SDC F (hospitals, police stations, emergency control centers in areas near major active faults). Design specifications are then determined according to the SDC in accordance with Chapter 16 of the CBC. Chapter 16, Section 1613 provides earthquake loading specifications for design and construction to resist the effects of earthquake motions in accordance with ASCE 7-05.

Chapter 18 of the CBC covers the requirements of geotechnical investigations (Section 1803); excavation, grading, and fills (Section 1804); load-bearing of soils (1806); foundations (Section 1808); shallow foundations (Section 1809); and deep foundations (Section 1810). Chapter 18 also describes analysis of expansive soils and the determination of the depth to groundwater table. For SDC D, E, and F, Chapter 18 requires analysis of slope instability, liquefaction, and surface rupture attributable to faulting or lateral spreading, plus an evaluation of lateral pressures on basement and retaining walls, liquefaction and soil strength loss, and lateral movement or reduction in foundation soil-bearing capacity. It also addresses mitigation measures to be considered in structural design, which may include ground stabilization, selection of appropriate foundation type and depths, selection of appropriate structural systems to accommodate anticipated displacements, or any combination of these measures. The potential for liquefaction and soil strength loss must be evaluated for site specific peak ground acceleration magnitudes and source characteristics consistent with the design earthquake ground motions.

Specifically, Section 1803.7 of the CBC requires geologic and earthquake engineering reports for all proposed construction. The purpose of the engineering report is to identify geologic and seismic conditions that may require mitigation. The reports, which are prepared by a California certified engineering geologist in consultation with a California-registered geotechnical engineer, assess the nature of the site and potential for earthquake damage based on appropriate investigations of the regional and site geology, project foundation conditions, and potential seismic shaking at the site. These reports must consider the most recent CGS Note 48 (Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings), CGS Special Publication 42: Fault Rupture Hazard Zones in California (for project sites proposed within an Alquist-Priolo Zone), and the most recent version of CGS Special Publication 117: Guidelines for Evaluating and Mitigating Seismic Hazard in California (for project sites proposed within a Seismic Hazard Zone). All conclusions must be fully supported by satisfactory data and analysis.

The geotechnical report required by Section 1803 provides completed evaluations of the foundation conditions of the site and the potential geologic and seismic hazards. It includes site specific evaluations of design criteria related to the nature and extent of foundation materials, groundwater conditions, liquefaction potential, and settlement potential and slope stability, as well as the results of the analysis of problem areas identified in the engineering geologic report. The geotechnical report incorporates estimates of the characteristics of site ground motion provided in the engineering geologic report. The geotechnical report must be prepared by a geotechnical engineer registered in the State of California with the advice of the certified engineering geologist and other technical experts, as necessary. The approved engineering geologic report is submitted with, or as

part of, the geotechnical report. Local jurisdictions in the SJCOG region typically regulate construction activities through a process that requires the preparation of a site specific geotechnical investigation, consistent with Title 24, Part 2, Chapter 18 of the CBC.

California Construction General Permit Order 2009-0009-DWQ

The California Construction General Permit Order 2009-0009-DWQ (Order) requires projects that would disturb one or more acres of soil, or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, to obtain coverage under the Order. As such, applicable projects are required to implement a Storm Water Pollution Prevention Plan (SWPPP) developed by a certified Qualified SWPPP Developer. The SWPPP includes Best Management Practices (BMPs) for erosion and sediment control.

California Department of Transportation Regulations and Seismic Design Criteria

The California Department of Transportation (Caltrans) has Seismic Design Criteria (SDC) which contain new and currently practiced seismic design and analysis methodologies for the design of new bridges in California. The SDC adopts a performance-based approach specifying minimum levels of structural system performance, component performance, analysis and design practices for ordinary standard bridges. The SDC has been developed with input from the Caltrans Offices of Structure Design, Earthquake Engineering and Design Support and Materials and Foundations. Memo 20-1 outlines the bridge category and classification, seismic performance criteria, seismic design philosophy and approach, seismic demands and capacities on structural components and seismic design practices that collectively comprise Caltrans' seismic design methodology (Caltrans 2010).

California Assembly Bill 885 (2000)

AB 885 (Chapter 781, Statutes of 2000) required SWRCB to draft and implement regulations for siting, installation, operation, and maintenance of on-site wastewater treatment systems. Proposed regulations were issued in 2009 and adopted in June 2012.

California Public Resources Code

Section 5097.5 of the Public Resources Code states:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

Here "public lands" means those owned by, or under the jurisdiction of, the state or any city, county, district, authority, or public corporation, or any agency thereof. Consequently, public agencies are required to comply with Public Resources Code Section 5097.5 for their own activities, including construction and maintenance, and for permit actions (e.g., encroachment permits) undertaken by others.

c. Local Laws, Regulations, and Policies

San Joaquin County General Plan

The 2035 San Joaquin County General Plan Public Health and Safety Element contains goals and policies related to seismic and geologic hazards. Goal PHS-3 is "To protect life and property from seismic and geologic hazards." The County shall consider the risk to human safety and property from seismic and geologic hazards in designating the location and intensity for new development (PHS3.1). Emergency services, major utility lines and facilities, manufacturing plants using or storing hazardous materials, high occupancy structures, and facilities housing dependent populations are not to be located within one-eighth of a mile of any active fault or on soil that is highly susceptible to liquefaction (PHS-3.2). Emergency service facilities must be capable of withstanding earthquakes and remain operational to provide emergency response (PHS-3.3). New developments in areas determined to have high liquefaction potential must include detailed site-specific liquefaction studies (PHS-3.4). All proposed structures, utilities, or public facilities within County-recognized areas of near-surface subsidence or liquefaction shall be located and constructed in a manner that minimizes or eliminates potential damage (PHS-3.5). The county shall promote regional and local efforts to reduce subsidence in the Delta (PHS-3.6). The county shall encourage the planting of vegetation to decrease loss of soil by erosion (PHS-3.7). The county shall support soil conservation and restoration efforts of the US Soil Conservation Service and the Resource Conservation Districts (PHS-3.8).

City General Plans and Regulations

City of Escalon General Plan

The Safety Element of the City of Escalon's General Plan aims to protect the community from seismic and geologic hazards. Geologic Hazards Policies includes ensuring development and infrastructure projects are designed and planned to reduce risk related to seismic and geologic hazards. Specifically, the City of Escalon utilizes implementation strategies which implement California Building Code requirements and require development and infrastructure projects to identify and address potential adverse impacts associated with unstable soils (City of Escalon 2019).

City of Lathrop Comprehensive General Plan

The City of Lathrop Comprehensive General Plan includes goals and policies for achieving and maintaining safety from seismic events including preventing injury, loss of life, serious damage to critical facilities, and disruption in providing essential public services. Specific policies include, limiting building height to 50 feet, providing soils reports and geologic reports for proposed development, and require all new development to conform to the most recent seismic requirements of the Uniform Building Code (City of Lathrop 1991).

City of Lodi General Plan

Guiding Policy S-G2 Chapter 8: Safety of the City of Lodi's General Plan aims to prevent the loss of lives, injury, illness, and property damage due to flooding, hazardous materials, seismic and geologic hazards, and fire. Policies S-P18 through S-P22 require soils reports, grading and erosion plans, require geotechnical investigations be prepared for all proposed critical structures, and for buildings identified as seismically unsafe, prohibit change in use to higher occupancy or more intensive use

until an engineering evaluation has been conducted and structural deficiencies corrected consistent with the City of Lodi building codes (City of Lodi 2010).

Policy C-P18 of Chapter 7: Conservation of the City of Lodi's General Plan addresses procedures for the discovery of paleontological resources. It states (City of Lodi 2010):

> In the event that archaeological/paleontological resources are discovered during site excavation, the City shall require that grading and construction work on the project site be suspended until the significance of the features can be determined by a qualified archaeologist/paleontologist. The City will require that a qualified archeologist/ paleontologist make recommendations for measures necessary to protect any site determined to contain or constitute an historical resource, a unique archaeological resource, or a unique paleontological resource or to undertake data recovery, excavation, analysis, and curation of archaeological/paleontologist materials. City staff shall consider such recommendations and implement them where they are feasible in light of project design as previously approved by the City.

City of Manteca General Plan 2023

The Safety Element of the City of Manteca General Plan 2023 require the preparation of geological reports for proposed new development located in an area of potentially significant geologic hazards, require all new development to comply with the Uniform Building Code, California Health and Safety Code Section 19100, and ensures the City identify potentially hazardous buildings and adopt a mitigation program for these buildings (City of Manteca 2003).

City of Ripon General Plan

The City of Ripon General Plan's Community Health and Safety chapter includes goals and policies which aim to prevent the loss of life and property damage due to geological hazards. Policies from the San Joaquin County General Plan Public Health and Safety Element are incorporated into the City of Ripon's General Plan (City of Ripon 2006).

City of Stockton General Plan

The City of Stockton's Safety Element of the Envision Stockton 2040 General Plan Goal SAF-2 focuses on the protection of residents and businesses from natural and human-caused hazards. Actions SAF-2.2B through SAF-2.2D require period updating of emergency management plans, require critical facilities to be located, designed, and constructed to avoid or mitigate seismic and geologic events, and require coordination between the County Office of Emergency Services, other cities, and disaster agencies to coordinate emergency preparedness planning (City of Stockton 2018).

The Land Use Element of the Envision Stockton 2040 General Plan requires the following tasks by an approved archeologist or paleontologist prior to any project approval (City of Stockton 2018):

- Conduct a record search at the Central California Information Center located at California State University Stanislaus, the University of California Museum of Paleontology at Berkeley, and other appropriate historical or archaeological repositories.
- Conduct field surveys where appropriate.
- Prepare technical reports, where appropriate, meeting California Office of Historic Preservation or other appropriate standards.

- Where development cannot avoid an archaeological or paleontological deposit, prepare a treatment plan in accordance with appropriate standards, such as the Secretary of the Interior's Standards for Treatment of Archaeological Sites.

City of Tracy General Plan

The Safety Element of the City of Tracy's General Plan Goal SA-1 aims to reduce risks in the community from earthquakes and other geologic hazards. Specifically, Objectives SA-1.1 and SA-1.2 minimize the impacts of geologic hazards on land development and implement measures related to site preparation and building construction that protect life and property from seismic hazards. Policies that carry out these objectives include requiring underground utilities to be designed to withstand seismic forces, requiring geotechnical reports for projects where potentially serious geologic risks exist, enforcing California Building Code and Tracy Municipal Code standards (City of Tracy 2011).

The Community Character Element of the City of Tracy's General Plan Policies P4 and P5 under Objective CC-3.1 implement a condition of approval for projects that halt operations should a paleontological resource be discovered and require preservation of paleontological resources and implementation of conservation measures should any resources be found unexpectedly (City of Tracy 2011).

4.8.3 Impact Analysis

a. Methodology and Significance Thresholds

Appendix G of the State CEQA Guidelines identifies the following criteria for determining whether development facilitated by the proposed 2022 RTP/SCS would have a significant impact on geology and soils, namely an analysis of whether or not the 2022 RTP/SCS would:

1. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
    i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?
    ii. Strong seismic ground shaking,
    iii. Seismic-related ground failure, including liquefaction, or
    iv. Landslides;
2. Result in substantial soil erosion or the loss of topsoil;
3. 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;
4. Be located on expansive soil, creating substantial risks to life or property; or
5. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.
6. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with projects contained within the 2022 RTP/SCS. Section 4.8.3.c summarizes the impacts associated with capital improvement projects proposed in the 2022 RTP/SCS. Due to the programmatic nature of the 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1:	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides

Impact GEO-1 THE PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD NOT DIRECTLY OR INDIRECTLY CAUSE POTENTIAL SUBSTANTIAL ADVERSE EFFECTS, INCLUDING THE RISK OF LOSS, INJURY, OR DEATH INVOLVING RUPTURE OF A KNOWN EARTHQUAKE FAULT, STRONG SEISMIC GROUND SHAKING, SEISMIC-RELATED GROUND FAILURE, INCLUDING LIQUEFACTION, OR LANDSLIDES. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Fault rupture can occur along or immediately adjacent to faults during an earthquake. Fault rupture is characterized by ground cracks and displacement which could endanger life and property. Damage is typically limited to areas close to the moving fault.

Ground shaking effects are also the result of an earthquake, but the impacts can be widespread. Although a function of earthquake intensity, ground shaking effects can be magnified by the underlying soils and geology, which may amplify shaking at great distances. It is difficult to predict the magnitude of ground shaking following an earthquake, as shaking can vary widely within a relatively small area.

As indicated by Figure 4.8-1, transportation projects across the SJCOG region would not be vulnerable to fault rupture as none of the roadway projects for the proposed 2022 RTP/SCS are located within or near an active fault system. Proposed interchange and highway projects would take place along Interstate 580 near the Black Butte Fault, and along Interstate 205 and Interstate 5, near the Black Butte and Vernalis Faults, but these are considered potentially active rather than active. Land use growth envisioned under the proposed 2022 RTP/SCS would emphasize infill development and thus be implemented within the cities of the SJCOG region, none of which intersect earthquake fault zones, as shown in Figure 4.8-1. The city of Tracy is adjacent to the Black Butte and Vernalis Faults and has the potential to be at risk of adverse effects from ground shaking. However, any potential structural damage and the exposure of people to the risk of injury or death from structural failure would be minimized by compliance with California Building Code engineering design and construction measures. Foundations and other structural support features would be designed to resist or absorb damaging forces from strong ground shaking.

Although a function of earthquake intensity, ground-shaking effects can be magnified by the underlying soils and geology, which may amplify shaking at great distances. It is difficult to predict the magnitude of ground-shaking following an earthquake, as shaking can vary widely within a relatively small area. The type of transportation and land use projects proposed under the proposed 2022 RTP/SCS are unlikely to exacerbate seismic activity, fault rupture, or increases in ground shaking due to the nature of the project's effects, including construction, being near or on the

ground surface. Footings and pilings that could extend below the surface would be localized to the project site and require geological testing for specific impacts. The potential to directly, or indirectly, cause adverse impacts due to rupture of a known earthquake fault related to the projected land use pattern and planned transportation improvements from implementation of the proposed 2022 RTP/SCS would be less than significant.

Seismic related ground failure such as liquefaction may result from an earthquake in the SJCOG region. According to the San Joaquin County General Plan EIR, no specific countywide assessments to identify liquefaction hazards have been performed in San Joaquin County. Liquefaction typically occurs in areas underlain with loose saturated cohesion-less soils within the upper 50 feet of subsurface materials. The Counties of Contra Costa and Solano, which have similar Delta conditions as the SJCOG region, indicate the Delta area of the SJCOG region is likely to have areas with moderate to high susceptibility (San Joaquin County 2014). Detailed, site-specific geotechnical engineering investigations would be necessary to evaluate liquefaction potential more accurately in specific project areas and to identify and map the extent of locations in the SJCOG region subject to liquefaction.

Projects near the canal and levee system in the Delta are particularly susceptible to landslides. Much of the system has not been engineered to withstand forces that could be created by future earthquakes. Projects which are the most susceptible include regional highway segments which cross or are adjacent to steeply sloped streambanks within the Delta region, and projects near the Manteca-Lathrop area. Landslide risk also occurs in the southwestern region of the SJCOG region, within the foothills southwest of the City of Tracy; however proposed 2022 RTP/SCS projects do not extend into the foothills area of the SJCOG region. The potential to directly or indirectly cause adverse impacts due to seismic-related liquefaction or landslide from the projected land use development and planned transportation improvements from implementation of the proposed 2022 RTP/SCS would be less than significant.

All projects are required to adhere to design standards described in the CBC and all standard geotechnical investigation, design, grading, and construction practices to avoid or reduce impacts from earthquakes, ground shaking, ground failure, and landslides. These requirements would partially reduce seismic impacts. Moreover, construction within seismic zones as identified by the Alquist-Priolo Act and the Seismic Hazards Mapping Act of 1990 (PRC 2690 -2699.6) is required by the CBC to follow more stringent regulations to withstand fault ruptures and ground shaking effects from seismic activities. The CBC provides standards for various aspects of construction, including but not limited to: excavation, grading and earthwork construction; fills and embankments; expansive soils; foundation investigations; liquefaction potential; and soil strength loss. In accordance with California law and regulation, proponents of specific projects are required to comply with all provisions of the CBC for certain aspects of design and construction.

There are limited instances where the proposed land use pattern and planned transportation investments of the proposed 2022 RTP/SCS may result in growth in or near a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides prone areas, substantial geologic-related effects could still occur. The types of transportation and land use projects planned under the proposed 2022 RTP/SCS are unlikely to exacerbate seismic activity, fault rupture, or increases in ground shaking due to the nature of the project's effects, including construction, being near or on the ground surface. Footings and pilings that could extend below the surface would be localized to the project site and require geological testing for specific impacts. The proposed 2022 RTP/SCS would not have the potential to exacerbate risks related to seismic activity. Compliance with the CBC and provisions of the Alquist-Priolo Act,

including the preparation of a site-specific geotechnical investigation, would reduce the potential for seismic damage to occur as a result of implementation of proposed 2022 RTP/SCS projects. Compliance with the CBC and provisions of the Alquist-Priolo Act, including the preparation of a site-specific geotechnical investigation, would minimize the potential for seismic damage to occur as a result of implementation of proposed 2022 RTP/SCS projects. Based on the above analysis, impacts would be less than significant.

Mitigation Measures

None required.

Threshold 2:	Result in substantial soil erosion or the loss of topsoil

Impact GEO-2 THE PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD NOT RESULT IN SUBSTANTIAL SOIL EROSION OR THE LOSS OF TOPSOIL. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Erosion and grading have the potential to create unstable slopes and significant loss of topsoil can occur for projects where excavations require off-site soil disposal. The topography of the SJCOG region includes relatively wide expanses of fairly flat areas with soil conditions that exhibit minimal potential for erosion impacts. Varying topography exists within the foothills to the immediate southwest of the City of Tracy, however no proposed projects are southwest of Interstate 580 and South Corral Hollow Road, where the foothill region begins. Buildout under the proposed 2022 RTP/SCS would occur in conformance with Title 9 of the San Joaquin County Code of Ordinances for grading and erosion standards and guidelines. These ordinances would require the appropriate measures to prevent erosion as a result of implementation of transportation and land use projects under the proposed 2022 RTP/SCS, further reducing impacts.

In addition, the Construction General Permit would require a project specific Stormwater Pollution Prevention Plan (SWPP) to be prepared for each project that disturbs an area one acre or larger. The SWPPPs would include project specific best management practices (BMPs) designed to control drainage and erosion. Project BMPs to control erosion may include, but would not be limited to silt fencing, fiber rolls, slope stabilization and sandbags. These BMPs would be required as part of each individual project permit and would minimize impacts related to soil erosion and loss of topsoil as a result of construction or grading.

Adherence to the applicable ordinance codes and other local, State, and regulatory programs, as discussed above, would ensure that project-specific erosion and topsoil loss would be minimized. Because such effects would not be substantial, impacts related to erosion and loss of topsoil would be less than significant.

Mitigation Measures

No mitigation measures are required.

Threshold 3:	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
Threshold 4:	Be located on expansive soil, creating substantial direct or indirect risks to life or property

Impact GEO-3 IMPLEMENTATION OF TRANSPORTATION IMPROVEMENTS AND FUTURE PROJECTS INCLUDED IN THE LAND USE SCENARIO ENVISIONED IN THE PROPOSED 2022 RTP/SCS COULD BE LOCATED ON POTENTIALLY UNSTABLE SOILS, IN AREAS OF LATERAL SPREADING, SUBSIDENCE, OR HIGH LIQUEFACTION POTENTIAL, OR AREAS OF EXPANSIVE SOIL. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the proposed 2022 RTP/SCS could be prone to slope instability, liquefaction, and other soil-related hazards.

Ground failure, including liquefaction, lateral spreading, and subsidence, caused by an earthquake could occur in the SJCOG region depending on the underlying conditions including ground water level, relative size of soil particles, and density of subsurface materials within 50 feet of ground surface. Damage from earthquake-induced ground failure associated with liquefaction, lateral spreading, and subsidence could be high in buildings with foundations not properly constructed for such hazards. Ground failure associated with liquefaction would result in damage to transportation projects if not engineered appropriately.

Transportation projects exist near the Manteca-Lathrop area, as well as in the Delta area, where there is potential for landslides and liquefaction. Erosion and ground slumping of soils can also occur along the banks of rivers, such as the San Joaquin River. It is known subsidence occurs across the Delta and has caused a decrease in land elevation. Impacts related to these types of geological hazards are site specific and need to be evaluated on a project-by-project basis (San Joaquin County 2014).

New land use development and transportation projects constructed on expansive soils could be subject to damage or could become unstable when the underlying soil shrinks or swells. Soils with high clay content have the highest potential for shrink-swell. Within the SJCOG region, expansive soils are more common along the western boundary as well as its central portion, near Stockton, and some eastern portions. There are proposed 2022 RTP/SCS projects within areas of expansive soils (San Joaquin County 2014). However, expansive soils found on site can be remediated, as structures and foundations would be engineered to withstand the forces of expansive soil to ensure compliance with the CBC

The preparation of site-specific geotechnical studies prepared in accordance with requirements as set forth by the CBC, the Seismic Hazards Mapping Act, and standard industry practices would reduce impacts related to slope instability, liquefaction, soil expansion, and ground failure. Future projects under the proposed 2022 RTP/SCS would also be required to comply with local general plans and local building code requirements that contain seismic safety policies to resist ground failure through construction techniques, including structural design. Potential structural damage and the exposure of people to the risk of injury or death from structural failure would be minimized by compliance with California Building Code engineering design and construction measures. Foundations and other structural support features would be designed to resist or absorb damaging forces from expansive soils, liquefaction, or landslides. Land use and transportation projects included in the proposed 2022 RTP/SCS would be required to comply with the CBC, and local

building standards including the implementation of geotechnical practices such as ground treatments or replacing existing soils with engineered fill. Transportation projects that would involve the construction or improvements of bridge or overpass design would also be required to comply with Caltrans seismic design criteria which would reduce potential ground failure hazards. The proposed 2022 RTP/SCS would not have the potential to exacerbate risks related to ground failure.

Therefore, impacts related to ground failure hazards, including liquefaction, lateral spreading, subsidence, and expansive soils would be less than significant with compliance with the CBC, local general plans and building standards, and Caltrans design criteria for transportation projects, where applicable.

Mitigation Measures

No mitigation is required.

Threshold 5:	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater

Impact GEO-4 THE PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS IN RURAL AREAS MAY HAVE SOILS INCAPABLE OF ADEQUATELY SUPPORTING SEPTIC TANKS OR ALTERNATIVE WASTEWATER DISPOSAL SYSTEMS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The proposed 2022 RTP/SCS does not include transportation projects that would require the use of septic tanks or alternative wastewater disposal systems. The expansion and/or improvement of streets, highways, transit facilities, airports and related transportation infrastructure would not include elements that would require wastewater treatment or otherwise necessitate the development of septic systems.

Future land use development projects implementing the proposed 2022 RTP/SCS land use would connect to centralized wastewater infrastructure; and any development projects in rural areas requiring septic tanks or alternative wastewater disposal systems would be required to comply with local regulatory requirements that assure soils would adequately support these systems. Septic and alternative wastewater disposal systems would be required to comply with AB 885 and applicable County or City regulations. Septic systems in the SJCOG region would be required to comply with requirements as set forth by the San Joaquin County Environmental Health Department and San Joaquin County Municipal Code Title 5, Division 3, Chapter 1, Section 5-3004: Septic Tanks. Cities within the SJCOG region would further require compliance with municipal code requirements as set forth by individual jurisdictions. Therefore, impacts related to having soils incapable of adequately supporting the use of septic tanks and alternative wastewater disposal systems would be less than significant.

Mitigation Measures

No mitigation is required.

Threshold 6:	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature

Impact GEO-5 IMPLEMENTATION OF THE PROPOSED TRANSPORTATION IMPROVEMENTS AND THE LAND USE SCENARIO ENVISIONED BY 2022 RTP/SCS COULD CAUSE A SUBSTANTIAL ADVERSE CHANGE IN OR DISTURB KNOWN AND UNKNOWN PALEONTOLOGICAL RESOURCES AS DEFINED IN CEQA GUIDELINES SECTION 15064.5. IMPACTS TO PALEONTOLOGICAL RESOURCES WOULD BE SIGNIFICANT AND UNAVOIDABLE.

Paleontological resources are present throughout the SJCOG region. Therefore, it is possible to encounter known and unknown paleontological resources as a result of implementation of transportation improvement projects pursuant to the proposed 2022 RTP/SCS.

The *State CEQA Guidelines* provide no definition to the term "unique geologic feature." This phrase also has no common definition. However, a geologic unit could be considered unique if it is a stratotype, contributes to scientific research, or is exclusive to the region.

Many of the land use and transportation projects proposed under the proposed 2022 RTP/SCS consist of minor expansions of existing facilities that would not involve construction in previously undisturbed areas. However, depending on the location and extent of the proposed improvement and ground disturbance, paleontological resources or unique geologic features could be impacted. There are mapped areas with a higher occurrence of paleontological features, but it should be noted that any project overlying a geologic unit with high paleontological sensitivity could result in impacts, regardless of location relative to existing development. It is also possible that construction activities associated with some of the proposed roadway or bridge widening or extension projects could adversely impact paleontological resources or unique geologic features by exposing them to potential vandalism or causing displacement from the original context and integrity. Project-specific analysis would be required as individual projects are proposed.

In addition, the proposed 2022 RTP/SCS contains a future land use scenario that emphasizes infill near transit and within existing urbanized areas, but with development still allowed in more suburban and rural areas. It is possible that paleontological resources or unique geologic features could be located on or near future infill sites, or other development sites. Project grading and excavation for land development may disturb these known or undiscovered resources. Impacts to paleontological resources or unique geologic features would therefore be potentially significant. The following mitigation measures would reduce this impact.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures developed for the proposed 2022 RTP/SCS program where applicable for transportation projects that would result in impacts to paleontological resources and where feasible and necessary based on project and site-specific considerations. Cities and the County can and should implement these measures, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site specific conditions.

GEO-5 Paleontological Resources Impact Minimization

The implementing agency of a proposed 2022 RTP/SCS project involving ground disturbing activities (including grading, trenching, foundation work and other excavations) shall, or can and should, retain a qualified paleontologist, defined as a paleontologist who meets the Society of Vertebrate Paleontology (SVP) standards for Qualified Professional Paleontologist (SVP 2010), to conduct a Paleontological Resources Assessment (PRA). The PRA shall determine the age and paleontological sensitivity of geologic formations underlying the proposed disturbance area, consistent with SVP Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources (SVP 2010) guidelines for categorizing paleontological sensitivity of geologic units within a project area. If underlying formations are found to have a high potential (sensitivity) for paleontological resources and/or could be considered a unique geologic feature, the following measures shall apply:

- **Avoidance.** Avoid routes and project designs that would permanently alter unique paleontological and geological features. If avoidance practices cannot be implemented, the following measures shall apply.
- **Retention of a Qualified Paleontologist.** A Qualified Paleontologist shall be retained to create a Paleontological Resources Monitoring and Mitigation Program (PRMMP) to direct all mitigation measures related to paleontological resources. The Qualified Paleontologist shall meet the qualifications for a Qualified Professional Paleontologist, which is defined by the SVP as an individual, preferably with an M.S. or Ph.D. in paleontology or geology, who is experienced with paleontological procedures and techniques, who is knowledgeable in the geology of California, and who has worked as a paleontological mitigation project supervisor for a least two years (SVP 2010).
- **Paleontological Worker Environmental Awareness Program (WEAP).** Prior to the start of ground disturbance activity, construction personnel shall be informed on the appearance of fossils and the procedures for notifying paleontological staff should fossils be discovered by construction staff.
- **Paleontological Monitoring.** Paleontological monitoring shall be conducted by a qualified paleontological monitor, who is defined as an individual who has experience with collection and salvage of paleontological resources and meets the minimum standards of the SVP (2010) for a Paleontological Resources Monitor. The duration and timing of the monitoring will be determined by the Qualified Paleontologist based on the observation of the geologic setting from initial ground disturbance. If the Qualified Paleontologist determines that full-time monitoring is no longer warranted, based on the specific geologic conditions once the full depth of excavations has been reached, they may recommend that monitoring be reduced to periodic spot-checking or ceased entirely. Monitoring shall be reinstated if any new ground disturbances are required, and reduction or suspension shall be reconsidered by the Qualified Paleontologist at that time. In the event of a fossil discovery by the paleontological monitor or construction personnel, all work in the immediate vicinity of the find shall cease. A Qualified Paleontologist shall evaluate the find before restarting construction activity in the area. If it is determined that the fossil(s) is (are) scientifically significant, the Qualified Paleontologist shall complete the following conditions to mitigate impacts to significant fossil resources:
- **Fossil Salvage**. If fossils are discovered, the implementing agency shall be notified immediately, and the qualified paleontologist (or paleontological monitor) shall recover them. Typically, fossils can be safely salvaged quickly by a single paleontologist and not disrupt construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils)

require more extensive excavation and longer salvage periods. In this case, the paleontologist should have the authority to temporarily direct, divert or halt construction activity to ensure that the fossil(s) can be removed in a safe and timely manner.

- **Preparation and Curation of Recovered Fossils**. Once salvaged, fossils shall be identified to the lowest possible taxonomic level, prepared to a curation-ready condition, and curated in a scientific institution with a permanent paleontological collection along with all pertinent field notes, photos, data, and maps.
- **Final Paleontological Mitigation and Monitoring Report**. Upon completion of ground disturbing activity (and curation of fossils, if necessary) the Qualified Paleontologist shall prepare a final mitigation and monitoring report outlining the results of the PRMMP. The report shall include discussion of the location, duration and methods of the monitoring, stratigraphic sections, any recovered fossils, and the scientific significance of those fossils, and where fossils were curated. The report shall be submitted to the sponsor agency. If the monitoring efforts recovered fossils, then a copy of the report shall also be submitted to the designated museum repository.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate

Significance After Mitigation

Implementation of the above mitigation measure would reduce impacts to paleontological resources by requiring a Paleontological Resources Assessment for any projects under the proposed 2022 RTP/SCS that may impact sensitive paleontological resources. While implementation of Mitigation Measure GEO-5 would reduce impacts to the extent feasible, some project-specific impacts may be unavoidable. Therefore, this impact is significant and unavoidable. No additional mitigation measures to reduce this impact to less than significant levels are feasible.

c. Specific 2022 RTP/SCS Projects that May Result in Impacts

identifies proposed 2022 RTP/SCS projects that may result in geology and soils impacts as discussed above. Given the large number of projects envisioned across the SJCOG region in the proposed 2022 RTP/SCS, the table shows a representative rather than comprehensive list of projects that would generate these impacts. Listed projects are representative of the types of impacts and the types of projects that could be affected in different localities. Additional site-specific analysis will need to be conducted as the individual projects are implemented in order to determine the project-specific magnitude of impact. Mitigation measures discussed above would apply to these specific projects as well as any other proposed 2022 RTP/SCS projects that would result geology and soils-related impacts.

The state of California contains numerous paleontological resources throughout its state boundary. While some geologic units are known to have higher paleontological sensitivities than others, unknown paleontological resources may be encountered at all proposed 2022 RTP/SCS project sites. While additional site-specific paleontological studies could determine the sensitivity of site-specific underlying geologic units, it is impossible to accurately account for the existence of all paleontological resources prior to ground-disturbing activities. Therefore, due to the potential for all

proposed 2022 RTP/SCS projects to encounter paleontological resources, Table 4.8-2 does not specifically identify projects potentially impacted byGeo-5.

Table 4.8-2 Proposed 2022 RTP/SCS Projects That May Result in Impacts

Project Jurisdiction and Location	Improvement	Potential Impact
City of Lathrop		
I-5 at Louise Avenue	Reconstruct interchange (PM 16.4-16.8)	GEO-1
I-5 at Lathrop Road	Reconstruct interchange (PM 17.3/17.8)	GEO-1
SR 120 at Yosemite Ave/Guthmiller Road	Reconstruct interchange	GEO-1
Along Northwest side of I-5 from Brookhurst Blvd to Stewart Road	Construct new roadway parallel to I-5, 2 lanes from Brookhurst Blvd to Stewart Road	GEO-1
Along Northwest side of I-5 from Stewart Road to Paradise Road	Construct new roadway parallel to I-5, 4 lanes from Stewart Road to Paradise Road	GEO-1
Along Northwest side of I-5 from Brookhurst Blvd to Stewart Road	Widen from 2 to 4 lanes, from Brookhurst Blvd to Stewart Road	GEO-1
City of Manteca		
SR-120 at McKinley Avenue	Construct new interchange	GEO-1
SR-120 at Airport Way	Reconstruct interchange	GEO-1
SR-120 at Main Street	Reconstruct interchange	GEO-1
SR-99 at Raymus Expressway	Construction of new interchange	GEO-1
East of Airport Way to Union Road	Construct new 4 lane roadway (gap closure)	GEO-1
SR-120 to Yosemite Ave.	Widen from 2 to 4 lanes	GEO-1
Lathrop Road to Roth Road	Widen from 2 to 4 lanes	GEO-1
Main Street to SR-99	Widen from 2 to 4 lanes	GEO-1
McKinley Ave to West of Airport Way	Construct new 4 lane roadway	GEO-1
From East of UPRR to SR-99	Widen from 2 to 4 lanes	GEO-1
Main Street to SR-99	Construct new 4-lane expressway	GEO-1
Yosemite Ave. to Lathrop Road	Widen from 2 to 4 lanes	GEO-1
SR-120 to Woodward Ave	Construct new 2 lane expressway	GEO-1
Woodward Ave to McKinley Ave	Construct new 4 lane roadway	GEO-1
Woodward Ave to Main Street	Construct new 2 lane expressway	GEO-1
SR 120 to Lathrop Road	Widen from 4 to 6 lanes	GEO-1
City of Tracy		
I-580 at Mountain House Parkway	Reconstruct interchange	GEO-1
I-580 at Coral Hollow Road	Modification of existing interchange	GEO-1
I-580 at Lammers Road	Modification of existing interchange	GEO-1
I-580 at Iron Horse	Modification of existing interchange	GEO-1
I-205 to I-580	Widen from 2 to 4 lanes, including reconstruction of Delta-Mendota Canal and California Aqueduct bridges	GEO-1
Linne Road to I-580	Widen 2 to 4 lanes including ROW and construction of two bridges	GEO-1

4.8.4 Cumulative Impacts

The cumulative impact analysis area for geology and soils consists of the SJCOG region and adjoining counties. Information regarding these adjoining counties can be found in Section 3.0, *Environmental Setting*. Future development in this region that could impact geology and soils is considered in the analysis. This cumulative extent is used to evaluate potential direct and indirect, permanent and temporary impacts to increased exposure to seismic hazards, increased erosion and/or loss of topsoil, the presence of unstable or expansive soils, and the presence of paleontological resource or unique geologic features within the context of the cumulative impact analysis area.

Geology and soils impacts may be related to increased exposure to seismic hazards, increased erosion and/or loss of topsoil, the presence of unstable/expansive soils and alternative waste disposal or septic systems. Individual projects and developments in the cumulative impacts analysis area would be subject to geologic hazards based on site-specific conditions and project design. These effects occur independently of one another and are caused by site specific and project specific characteristics and conditions. In addition, existing regulations, such as the California Building Code, specify mandatory actions that must occur during project development, which would minimize effects from construction and operation of projects related to geology, soils, and seismicity as discussed above. Cumulative impacts related to geology, soils and seismicity would therefore be less than significant.

While projects envisioned under the 2022 RTP/SCS may be subject to seismic hazards, including ground-shaking, landslides, liquefaction, and subsidence, compliance with applicable requirements would reduce impacts. Future development envisioned under the 2022 RTP/SCS would be required to comply with the California Building Code, Seismic Hazards Mapping Act, Alquist Priolo Act, and local building codes, general plan goals and policies. Furthermore, geology and soils impacts are site specific by nature and would not result in cumulative impacts to the surrounding area. The 2022 RTP/SCS would not have a cumulatively considerable contribution to significant cumulative impacts related to geology, soils and seismicity.

Development and construction in the cumulative impacts analysis area would require excavation and ground disturbance. Excavation and ground disturbance could encounter and damage or destroy subsurface paleontological resources, depending on underlying geologic units and soils. While most paleontological resources are typically site specific, with impacts that are project specific, others may have regional significance. For example, fossils may capture a particular type of organism that was endemic to a region and therefore have regional significance. Due to the potential for a fossil of regional significance to be uncovered during excavation and ground disturbing activities of projects in the cumulative impact analysis area, cumulative impacts would be significant.

The 2022 RTP/SCS could cause a substantial adverse change in or disturb known and unknown paleontological resources and would therefore result in a cumulatively considerable contribution to the significant impact. Mitigation measures outlined above, would reduce paleontological resource impacts associated with 2022 RTP/SCS projects. However, as discussed in Impact GEO-5, it cannot be guaranteed that all future project-level impacts can be mitigated to a less than significant level. As such, the 2022 RTP/SCS contribution to cumulative impacts to paleontological resources would be cumulatively considerable.

This page intentionally left blank.

4.9 Greenhouse Gas Emissions and Climate Change

This section evaluates potential impacts related to greenhouse gas (GHG) emissions and climate change facilitated by the proposed 2022 RTP/SCS. Air quality impacts are discussed in Section 4.2, *Air Quality.*

4.9.1 Setting

a. Climate Change and Greenhouse Gases

Climate change is the observed increase in the average temperature of Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period. The term "climate change" is often used interchangeably with the term "global warming," but "climate change" is preferred to "global warming" because it helps convey other changes in addition to rising temperatures. The baseline against which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. The global climate changes continuously, as evidenced by repeated episodes of substantial warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed substantial acceleration in the rate of warming during the past 150 years. The United Nations Intergovernmental Panel on Climate Change (IPCC) expressed that the rise and continued growth of atmospheric carbon dioxide (CO_2) concentrations is unequivocally due to human activities in the IPCC's Sixth Assessment Report (2021). Human influence has warmed the atmosphere, ocean, and land, which has led the climate to warm at an unprecedented rate in the last 2,000 years. It is estimated that between the period of 1850 through 2019, that a total of 2,390 gigatonnes of anthropogenic CO_2 was emitted. It is likely that anthropogenic activities have increased the global surface temperature by approximately 1.07 degrees Celsius between the years 2010 through 2019 (IPCC 2021). Furthermore, since the late 1700s, estimated concentrations of CO_2, methane, and nitrous oxide in the atmosphere have increased by over 43 percent, 156 percent, and 17 percent, respectively, primarily due to human activity (United States Environmental Protection Agency [U.S. EPA] 2021a). Emissions resulting from human activities are thereby contributing to an average increase in Earth's temperature.

Gases that absorb and re-emit infrared radiation in the atmosphere are called GHGs. The gases widely seen as the principal contributors to human-induced climate change include CO_2, methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere, and natural processes, such as oceanic evaporation, largely determine its atmospheric concentrations.

GHGs are emitted by natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are usually by-products of fossil fuel combustion, and CH_4 results from off-gassing associated with agricultural practices and landfills. Human-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and SF_6 (U.S. EPA 2021b).

Different types of GHGs have varying global warming potentials (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emitted, referred to as "carbon dioxide equivalent" (CO_2e), which is the amount of GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane has a GWP of 30, meaning its global warming effect is 30 times greater than CO_2 on a molecule per molecule basis (IPCC 2021).[1]

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat-trapping effect of GHGs, the earth's surface would be about 33 degrees Celsius (°C) cooler (World Meteorological Organization 2020). However, since 1750, estimated concentrations of CO_2, CH_4, and N_2O in the atmosphere have increased by 36 percent, 148 percent, and 18 percent, respectively, primarily due to human activity (Forster et al. 2007). GHG emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, are believed to have elevated the concentration of these gases in the atmosphere beyond the level of concentrations that occur naturally.

b. Greenhouse Gas Emissions Inventories

United States Emissions Inventory

Total U.S. GHG emissions were 6,558 MMT of CO_2e in 2019[2]. Emissions decreased by 1.7 percent from 2018 to 2019; since 1990, total U.S. emissions have increased by an average annual rate of 0.06 percent for a total increase of 1.8 percent between 1990 and 2019. The decrease from 2018 to 2019 reflects the combined influences of several long-term trends, including population changes, economic growth, energy market shifts, technological changes such as improvements in energy efficiency, and decrease carbon intensity of energy fuel choices. In 2019, the industrial and transportation end-use sectors accounted for 30 percent and 29 percent, respectively, of nationwide GHG emissions while the commercial and residential end-use sectors accounted for 16 percent and 15 percent of nationwide GHG emissions, respectively, with electricity emissions distributed among the various sectors (U.S. EPA 2021b).

California Emissions Inventory

Based on the California Air Resources Board (CARB) California GHG Inventory for 2000-2019, California produced 418.2 MMT CO_2e in 2019 (CARB 2021a). The largest single source of GHG in California is transportation, contributing 40 percent of the State's total GHG emissions. Industrial sources are the second-largest source of the state's GHG emissions, contributing 21 percent of the State's GHG emissions (CARB 2021a). The magnitude of California's total GHG emissions is due in part to its large size and large population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions as compared to other states is its relatively mild climate. In 2016, the State of California achieved its 2020 GHG emission reduction target of reducing emissions to 1990 levels as emissions fell below 431 MMT of CO_2e (CARB 2021a). The annual 2030 statewide target emissions level is 260 MMT of CO_2e (CARB 2017).

[1] The Intergovernmental Panel on Climate Change's (2021) *Sixth Assessment Report* determined that methane has a GWP of 30. However, the 2017 Climate Change Scoping Plan published by the California Air Resources Board uses a GWP of 25 for methane, consistent with the Intergovernmental Panel on Climate Change's (2007) *Fourth Assessment Report*. Therefore, this analysis utilizes a GWP of 25.
[2] The 2020 Total U.S. GHG Emissions Inventory is available; however, it is not discussed in this analysis because 2020 emissions were substantially influenced by the COVID-19 pandemic and therefore not characteristic of "normal" conditions.

c. Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Long-term trends have found that each of the past four decades has been warmer than all the previous decades in the instrumental record and the decade from 2011 through 2020 has been the warmest. The observed global mean surface temperature (GMST) for the decade from 2011 to 2020 was approximately 1.09°C (0.95°C to 1.20°C) higher than the average GMST over the period from 1850 to 1900. Due to past and current activities, anthropogenic GHG emissions are increasing global mean surface temperature at a rate of 0.2°C per decade. In addition to these findings, the latest IPCC report states that "human-induced climate change is already affecting many weather and climate extremes in every region across the globe" (IPCC 2021). These climate change impacts include climate change sea level rise, increased weather extremes, and substantial ice loss in the Arctic over the past three decades.

According to *California's Fourth Climate Change Assessment*, statewide temperatures from 1986 to 2016 were approximately 0.6 to 1.1°C higher than those recorded from 1901 to 1960. Potential impacts of climate change in California may include reduced water supply from snowpack, sea level rise, more extreme heat days per year, more large forest fires, and more drought years (State of California 2018). In addition to statewide projections, *California's Fourth Climate Change Assessment* includes regional reports that summarize climate impacts and adaptation solutions for nine regions of the state and regionally specific climate change case studies (State of California 2018). However, while there is growing scientific consensus about the possible effects of climate change at a global and statewide level, current scientific modeling tools are unable to predict what local impacts may occur with a similar degree of accuracy. A summary follows of some of the potential effects that could be experienced in California and the SJCOG region as a result of climate change.

Public Health

Climate change is expected to cause a number of impacts which could negatively affect public health in the SJCOG region. As temperatures increase, the Central Valley is set to experience an increased number of extreme heat days, which may lead to increases in the number of heat-related deaths and illnesses (State of California 2018). An increase in the frequency and severity of wildfires may contribute to worsening air quality and cause additional illnesses such as asthma. Higher temperatures could also lead to increased air pollution formation and potentially accelerate the spread of certain diseases and pests. These adverse impacts may also disproportionately burden vulnerable populations.

Air Quality

Scientists project that the annual average maximum daily temperatures in California could rise by 2.4 to 3.2°C in the next 50 years and by 3.1 to 4.9°C in the next century (State of California 2018). Higher temperatures are conducive to air pollution formation, and rising temperatures could therefore result in worsened air quality in California. As a result, climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. In addition, as temperatures have increased in recent years, the area burned by wildfires throughout the state has increased, and wildfires have occurred at higher elevations in

the Sierra Nevada Mountains (State of California 2018). If higher temperatures continue to be accompanied by an increase in the incidence and extent of large wildfires, air quality could worsen. Severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state.

Water Supply

Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future precipitation trends and water supplies in California. Year-to-year variability in statewide precipitation levels has increased since 1980, meaning that wet and dry precipitation extremes have become more common (California Department of Water Resources 2018). This uncertainty regarding future precipitation trends complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The average early spring snowpack in the western U.S., including the Sierra Nevada Mountains, decreased by about 10 percent during the last century. During the same period, sea level rose over 0.15 meter along the central and southern California coasts (State of California 2018). The Sierra snowpack provides the majority of California's water supply as snow that accumulates during wet winters is released slowly during the dry months of spring and summer. A warmer climate is predicted to reduce the fraction of precipitation that falls as snow and the amount of snowfall at lower elevations, thereby reducing the total snowpack (State of California 2018). Projections indicate that average spring snowpack in the Sierra Nevada and other mountain catchments in central and northern California will decline by approximately 66 percent from its historical average by 2050 (State of California 2018).

Agriculture

California has a roughly $49 billion annual agricultural industry that produces nearly a third of the country's vegetables and over half of the country's fruits and nuts (California Department of Food and Agriculture 2021). Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, certain regions of agricultural production could experience water shortages of up to 16 percent, which would increase water demand as hotter conditions lead to the loss of soil moisture. In addition, crop yield could be threatened by water-induced stress and extreme heat waves, and plants may be susceptible to new and changing pest and disease outbreaks (State of California 2018). Temperature increases could also change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (California Climate Change Center 2006).

Ecosystems and Wildlife

Climate change and the potential resultant changes in weather patterns could have ecological effects at the global and local scale. Rising temperatures could have four major impacts on plants and animals: timing of ecological events; geographic distribution and range of species; species composition and the incidence of nonnative species within communities; and ecosystem processes, such as carbon cycling and storage (Parmesan 2006; State of California 2018).

4.9.2 Regulatory Setting

The following regulations address both climate change and GHG emissions.

a. Federal Laws, Regulations, and Policies

Clean Air Act

The U.S. Supreme Court determined in *Massachusetts et al. v. Environmental Protection Agency et al.* ([2007] 549 U.S. 05-1120) that the U.S. EPA has the authority to regulate motor-vehicle GHG emissions under the federal Clean Air Act. The U.S. EPA issued a Final Rule for mandatory reporting of GHG emissions in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines and requires annual reporting of emissions. In 2012, the U.S. EPA issued a Final Rule that established the GHG permitting thresholds that determine when Clean Air Act permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

In *Utility Air Regulatory Group v. Environmental Protection Agency* (134 S. Ct. 2427 [2014]), the U.S. Supreme Court held the U.S. EPA may not treat GHGs as an air pollutant for purposes of determining whether a source can be considered a major source required to obtain a PSD or Title V permit. The Court also held that PSD permits otherwise required based on emissions of other pollutants, may continue to require limitations on GHG emissions based on the application of Best Available Control Technology.

Corporate Average Fuel Economy Standards

The Energy Policy and Conservation Act in 1975 established the Corporate Average Fuel Economy Standards (CAFE standards). The CAFE standards are Federal rules established by the National Highway Traffic Safety Administration (NHTSA) that set fuel economy standards for all new passenger cars and light trucks sold in the United States. The CAFE standards become more stringent each year, reaching an estimated 38.3 miles per gallon for the combined industry-wide fleet for model year 2020 (77 Federal Register 62624 et seq. [October 15, 2012, Table I-1).

In September 2019, U.S. EPA and the National Highway Traffic Safety Administration issued the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule. Part One, “One National Program” (84 FR 51310), revokes a waiver granted by U.S. EPA to the State of California under Section 209 of the CAA to enforce more stringent emission standards for motor vehicles than those required by U.S. EPA for the explicit purpose of GHG reduction, and indirectly, criteria air pollutants and ozone precursor emission reduction. This revocation became effective on November 26, 2019 and could have restricted the ability of CARB to enforce more stringent GHG emission standards for new vehicles and set zero emission vehicle mandates in California. However, on December 21, 2021, the National Highway NHTSA published its Corporate Average Fuel Economy (CAFE) Preemption rule, which finalizes its repeal of 2019’s SAFE Rule Part One.

Part Two addresses CAFE standards for passenger cars and light trucks for model years 2021 to 2026. This rulemaking proposes new CAFE standards for model years 2022 through 2026 and would amend existing CAFE standards for model year 2021. The proposal would retain the model year 2020 standards (specifically, the footprint target curves for passenger cars and light trucks) through model year 2026. The proposal addressing CAFE standards was jointly developed by NHTSA and U.S. EPA, with U.S. EPA simultaneously proposing tailpipe CO_2 standards for the same vehicles covered by the same model years. However, on March 31, 2022, the NHTSA finalized new CAFE Standards for model years 2024 through 2026 that would increase federal CAFE standards compared to the SAFE Rule Part Two (NHTSA 2022).

b. State Laws, Regulations, and Policies

CARB is responsible for the coordination and oversight of state and regional GHG emissions reduction programs in California. There are numerous regulations aimed at reducing the state's GHG emissions. These initiatives are summarized below.

California Advanced Clean Cars Program

Assembly Bill (AB) 1493 (2002), California's Advanced Clean Cars program (referred to as "Pavley"), requires CARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, U.S. EPA granted the waiver of Clean Air Act preemption to California for its GHG emission standards for motor vehicles, beginning with the 2009 model year, which allows California to implement more stringent vehicle emission standards than those promulgated by the U.S. EPA. Pavley I regulates model years from 2009 to 2016 and Pavley II, now referred to as "LEV (Low Emission Vehicle) III GHG," regulates model years from 2017 to 2025. The Advanced Clean Cars program coordinates the goals of the LEV, Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs, and would provide major reductions in GHG emissions.

Executive Order S-3-05

Executive Order (EO) S-3-05, among other things, established the following GHG emission reduction goals for California: reduction to 2000 levels by 2010; to 1990 levels by 2020; and to 80 percent below 1990 levels by 2050.

California Global Warming Solutions Act of 2006 (Assembly Bill 32 and Senate Bill 32)

The "California Global Warming Solutions Act of 2006," AB 32, outlines California's major legislative initiative for reducing GHG emissions (Chapter 488, Statutes of 2006). AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan that outlines the main State strategies for reducing GHGs to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions. Based on this guidance, CARB approved a 1990 statewide GHG level and 2020 target of 431 MMT of CO_2e. CARB approved the Scoping Plan on December 11, 2008, and the Plan included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among others (CARB 2008). Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since the Plan's approval.

CARB approved the 2013 Scoping Plan update in May 2014. The update defined CARB's climate change priorities for the next five years and set the groundwork to reach post-2020 statewide goals. The update highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluated how to align the State's longer term GHG reduction strategies with other State policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use (CARB 2014).

On September 8, 2016, the governor signed Senate Bill (SB) 32 into law (Chapter 429, Statutes of 2016), extending the California Global Warming Solutions Act of 2006 by requiring the State to further reduce GHG emissions to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). SB 32 became effective on January 1, 2017 and codifies the 2030 goal set in

EO B-30-15. On December 14, 2017, CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, and implementation of recently adopted policies and legislation, such as SB 1383 (see below). The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2013 Scoping Plan Update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with statewide per capita goals of six MT of CO_2e by 2030 and two MT of CO_2e by 2050 (CARB 2017). As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, sub-regional, or regional level), but not for specific individual projects because they include all emissions sectors in the state (CARB 2017).

Executive Order S-01-07 (Low Carbon Fuel Standard)

EO S-01-07 (17 California Code of Regulations 95480 et seq.) requires the state to achieve a 10 percent or greater reduction by 2020 in the average fuel carbon intensity for transportation fuels in California regulated by CARB. CARB identified the Low Carbon Fuel Standard (LCFS) as a discrete early action item under AB 32.

In 2018, CARB approved amendments to the LCFS regulation, which included strengthening and smoothing the carbon intensity benchmarks through 2030 in line with California's 2030 GHG emission reduction target enacted through SB 32, adding new crediting opportunities to promote zero emission vehicle adoption, alternative jet fuel, carbon capture and sequestration, and advanced technologies to achieve deep decarbonization in the transportation sector.

Senate Bill 375

SB 375, signed in August 2008, enhances the State's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. SB 375 aligns regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPOs) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the MPO's Regional Transportation Plan (RTP). SJCOG was assigned targets of a 12 percent reduction in GHG emissions from per capita passenger vehicles by 2020 and a 16 percent reduction in GHG emissions from per capita passenger vehicles by 2035, relative to 2005 emission levels (CARB 2020b). However, the proposed 2022 RTP/SCS cannot influence the achievement of target year 2020 GHG emissions. Therefore, SJCOG will report on meeting 2035 goals with submittal of this SCS for review by CARB.

Executive Order B-16-12

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

- Infrastructure to support up to one million ZEVs by 2020,
- Widespread use of ZEVs for public transportation and freight transport by 2020,
- Over 1.5 million ZEVs on California roads by 2025,
- Annual displacement of at least 1.5 billion gallons of petroleum fuels by 2025, and

- A reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels by 2050.

AB 197

AB 197 of 2016 (Chapter 250, Statutes of 2016) expands CARB membership to include two nonvoting members from the Legislature; creates a Joint Legislative Committee on Climate Change Policies to make recommendations to the Legislature concerning climate change policies; provides for annual reporting of GHG emissions from sectors covered by the AB 32 Scoping Plan as well as evaluations of regulatory requirements and other programs that may affect GHG emissions trends; and specifies that the adoption of GHG emissions reduction rules and regulations shall consider the social costs. In addition, Scoping Plan updates are required to identify the range of potential GHG emissions reductions and the cost-effectiveness for each emissions reduction measure, compliance mechanism and incentive.

Senate Bill 1383

Adopted in September 2016, SB 1383 requires CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants (Chapter 395, Statutes of 2016). SB 1383 requires the strategy to achieve the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SB 1383 also requires the California Department of Resources Recycling and Recovery, in consultation with CARB, to adopt regulations that achieve specified targets for reducing organic waste in landfills. In addition, SB 1383 requires CARB to adopt regulations to be implemented on or after January 1, 2024 specific to the dairy and livestock industry, requiring a 40 percent reduction in methane emissions below 2013 levels by 2030, if certain conditions are met.

Senate Bill 100

Adopted on September 10, 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the State's Renewables Portfolio Standard Program, which was last updated by SB 350 in 2015. SB 100 requires electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045.

Executive Order B-55-18

On September 10, 2018, the former Governor Brown issued Executive Order (EO) B-55-18, which established a new statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing statewide GHG reduction goals established by SB 375, SB 32, SB 1383, and SB 100. The 2022 Scoping Plan Update will assess progress towards achieving the SB 32 target and layout out a path to achieve carbon neutrality (CARB 2022).

Executive Order N-19-19

EO N-19-19 was signed on September 20, 2019 and is intended to require a redoubling of the State's efforts to reduce GHG emissions and mitigate the impacts of climate change while building a sustainable, inclusive economy. This EO includes four main directives which include investment, transportation, state buildings and operations, and zero-emissions vehicles.

Senate Bill 391

The California Transportation Plan Act requires the California Department of Transportation (Caltrans) to prepare a statewide plan that addresses how the state will achieve maximum feasible emissions reductions to attain a statewide reduction of GHG emissions to 1990 levels by 2020 and 80 percent below 1990 levels by 2050. Caltrans prepared the original California Transportation Plan in June 2016 and a released an update of the plan in February 2021 (Caltrans 2021).

As EO B-55-18 establishes a goal of achieving economy-wide carbon neutrality in California by 2045, the plan establishes policies and strategies to move toward a carbon-neutral transportation system. However, current trends to due not indicate the state will achieve carbon neutrality. The statewide strategy has not been developed to achieve carbon neutrality and regional targets do not require any Metropolitan Planning Organization's RTP to achieve carbon neutrality over the current planning horizon.

Executive Order N-79-20

EO N-79-20 established a statewide goal that 100 percent of in-state sales of new passenger cars and trucks will be zero-emission by 2035 and that 100 percent of medium- and heavy-duty vehicles in the state be zero-emission by 2035 for drayage trucks and by 2045 for all operations where feasible.

Executive Order N-82-20

EO N-82-20 established a goal of conserving at least 30 percent of California's lands and coastal waters by 2030 and directed state agencies to create a Natural and Working Lands Climate Smart Strategy to advance the State's carbon neutrality goal and builds climate resilience.

California Building Standards Code

The California Code of Regulations (CCR) Title 24 is referred to as the California Building Code, or CBC. It consists of a compilation of several distinct standards and codes related to building construction including plumbing, electrical, interior acoustics, energy efficiency, and handicap accessibility for persons with physical and sensory disabilities. The CBC's energy-efficiency and green building standards are outlined below. The 2019 Title 24 standards are currently in effect. However, at the time of this EIR, the 2022 Title 24 standards have been adopted and will go into effect on January 1, 2023.

Part 6 – Building Energy Efficiency Standards/Energy Code

California Code of Regulations Title 24, Part 6 is the Building Energy Efficiency Standards or California Energy Code. This code, originally enacted in 1978, establishes energy-efficiency standards for residential and non-residential buildings in order to reduce California's energy demand. The Energy Code is updated periodically to incorporate and consider new energy-efficiency technologies and methodologies as they become available. New construction and major renovations

must demonstrate their compliance with the current Energy Code through submittal and approval of a Title 24 Compliance Report to the local building permit review authority and the California Energy Commission. The 2019 Title 24 standards are the latest iteration of the statewide building energy efficiency standards because they became effective on January 1, 2020. All buildings for which an application for a building permit is submitted on or after January 1, 2020, must follow the 2019 standards. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The CEC Impact Analysis estimates that nonresidential buildings will be 30 percent more energy efficient compared to buildings built consistent with 2016 Building Energy Efficiency Standards, and single-family homes will be 7 percent more energy efficient (CEC 2018). Due to the solar requirement for all new homes, the CEC also estimates that the 2019 standards will cut energy demand from grid electricity in new homes by more than 50 percent (CEC 2018). The building efficiency standards are enforced through the local plan check and building permit process. Local government agencies may adopt and enforce additional energy standards for new buildings as reasonably necessary due to local climatologic, geologic, or topographic conditions, provided that these standards exceed those provided in Title 24.

Part 11 – California Green Building Standards/CALGreen

The California Green Building Standards Code, referred to as CALGreen, was added to Title 24 as Part 11, first in 2009 as a voluntary code, which then became mandatory effective January 1, 2011 (as part of the 2010 California Building Standards Code). The 2019 CALGreen includes mandatory minimum environmental performance standards for all ground-up new construction of residential and non-residential structures. It also includes voluntary tiers (Tiers I and II) with stricter environmental performance standards for these same categories of residential and non-residential buildings. Local jurisdictions must enforce the minimum mandatory CALGreen standards and may adopt additional amendments for stricter requirements.

The mandatory standards require:

- 20 percent reduction in indoor water use relative to specified baseline levels;[3]
- 65 percent construction/demolition waste diverted from landfills;
- Inspections of energy systems to ensure optimal working efficiency;
- Low-pollutant emitting exterior and interior finish materials such as paints, carpets, vinyl flooring, and particleboards;
- Dedicated circuitry to facilitate installation of electric vehicle charging stations for certain land uses; and
- Installation of electric vehicle charging stations for certain land uses.

The voluntary standards require:

- **Tier I:** stricter energy efficiency requirements, stricter water conservation requirements for specific fixtures, 65 percent reduction in construction waste with third-party verification, 10 percent recycled content for building materials, 20 percent permeable paving, 20 percent cement reduction, and cool/solar reflective roof; and

[3] Similar to the compliance reporting procedure for demonstrating Energy Code compliance in new buildings and major renovations, compliance with the CALGreen water-reduction requirements must be demonstrated through completion of water use reporting forms. Buildings must demonstrate a 20 percent reduction in indoor water use by either showing a 20 percent reduction in the overall baseline water use as identified in CALGreen or a reduced per-plumbing-fixture water use rate.

- **Tier II:** stricter energy efficiency requirements, stricter water conservation requirements for specific fixtures, 75 percent reduction in construction waste with third-party verification, 15 percent recycled content for building materials, 30 percent permeable paving, 25 percent cement reduction, and cool/solar reflective roof.

California State Transportation Agency (CalSTA) Climate Action Plan for Transportation Infrastructure (CAPTI)

Adopted in July 2021, the Climate Action Plan for Transportation Infrastructure (CAPTI) details how the State recommends investing billions of discretionary transportation dollars annually to aggressively combat and adapt to climate change while supporting public health, safety and equity (CalSTA 2021). CAPTI builds on EOs signed by Governor Gavin Newsom in 2019 and 2020 targeted at reducing GHG emissions in transportation, which account for more than 40 percent of all emissions, to reach the State's ambitious climate goals. The CAPTI provides investment strategies that focuses on expanding travel options in California and ensuring said investments also prioritize advancing equity and climate priorities in the State.

c. Local Laws, Regulations, and Policies

Four of SJCOG's member jurisdictions have climate action plans (CAPs) that set goals and targets for the reduction of GHG emissions and outline policies to help achieve those goals. The cities of Stockton, Tracy, Lodi, and Manteca have conducted baseline emissions inventories, which establish a reference point for GHG emissions reduction. The City of Stockton CAP (2014), City of Tracy CAP (2011), City of Lodi CAP (2014), and City of Manteca CAP (2013) also establish GHG reduction targets and reduction measures to meet those targets. To date, no other jurisdictions in the SJCOG region have adopted CAPs. Baseline and projected business-as-usual GHG emissions from the respective CAPs and jurisdictions are shown in Table 4.9-1 below. Projections beyond 2020 are only available for the City of Lodi and the City of Manteca. The inventories and projections below include emissions produced by transportation, electricity and natural gas consumptions, water supply and conveyance, wastewater treatment, agriculture, and solid waste disposal.

Table 4.9-1 GHG Emissions Inventories for SJCOG Member Jurisdictions

	Baseline		Projected Business-as-Usual	
Jurisdiction	Year	Emissions (MT of CO_2e/year)	Year	Emissions (MT of CO_2e/year)
Stockton	2005	2,360,932	2020	2,672,519
Tracy	2006	1,338,872	2020	1,735,022
Lodi	2008	486,628	2030	852,575
Manteca	2005	400,346	2035	742,186

Sources: City of Stockton 2014; City of Tracy 2011; City of Lodi 2014; City of Manteca 2013

The types and quantity of emissions produced in the SJCOG region vary among jurisdictional boundaries. However, for most jurisdictions, transportation and energy consumption are responsible for the majority of GHG emissions. To address these emissions, policies included in local CAPs in the region establish a framework for improved circulation networks and energy conservation. Transportation policies aim to reduce vehicle miles traveled (VMT) by offering more opportunities for alternative transportation modes, such as bicycling and transit use. In addition, many of the CAPs include policies to promote transit-oriented (TOD) development. In order to

reduce emissions produced by energy usage, jurisdictions have established policies that will facilitate and encourage energy efficiency for both residential and commercial land uses along with programs to improve energy efficiencies in old and new buildings and decrease the use of fossil fuels by providing incentives for use of renewable energy.

4.9.3 Impact Analysis

a. Methodology and Significance Thresholds

Significance Thresholds

Appendix G of the State CEQA Guidelines identifies the following two general criteria for determining whether a project's impacts would have a significant impact related to GHG emissions. Specific criteria under each general criterion have been developed for this EIR.

1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. An increase that exceeds the following threshold would be considered a significant impact:
    a. A net increase in GHG emissions by 2046 compared to existing baseline conditions.
2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Any conflict with the following thresholds would be considered a significant impact:
    a. Conflict with regional SB 375 per capita passenger vehicle CO_2 emission reduction targets of 16 percent by 2035 from 2005 levels;
    b. Conflict with state's ability to achieve SB 32 GHG reduction target, which aims to reduce statewide emissions to 40 percent below 1990 levels by 2030;
    c. Conflict with state's ability to achieve EO B-55-18 carbon neutrality goal by 2045 or EO S-3-05 GHG reduction 2050 goal, which aims to reduce statewide emissions to 80 percent below 1990 levels by 2050; or
    d. Conflict with applicable local GHG emission reduction plans.

The San Joaquin Valley Air Pollution Control District (SJVCAPCD) has not adopted GHG significance thresholds that are applicable to evaluating the impacts of the proposed 2022 RTP/SCS in light of the State's post-2020 GHG emission reduction targets. In the absence of applicable SJVAPCD-adopted thresholds, this section uses the project-specific thresholds of significance listed above for each GHG impact criterion in Appendix G.

Methodology

Mobile Source Emissions Modeling

GHG emissions from on-road mobile sources were calculated using the emission factors, fleet mix, and vehicle trip and population estimates from CARB's EMFAC2021 model and Total Daily VMT from SJCOG's Regional Travel Demand Model (as further described in Section 4.14, *Transportation*), shown in Table 4.9-2. Detailed calculations are available in Appendix A.

Table 4.9-2 Proposed 2022 RTP/SCS Total Daily VMT

Year	Total Daily VMT
2005 Baseline	14,600,612
2016 Baseline	17,015,116
2030 with Proposed 2022 RTP/SCS[1]	20,686,572
2046 with Proposed 2022 RTP/SCS	23,495,442

[1] In the absence of specific VMT data for year 2030, regional VMT for year 2030 was calculated via linear interpolation of VMT for years 2029 and 2031.

Source: Appendix A

EMFAC2021 emission factors are established by CARB and incorporate mobility assumptions (e.g., vehicle fleets, speed, delay times, average trip lengths, time of day and total travel time) and socioeconomic growth projections based on data from sources including the Bureau of Automotive Repair, Caltrans, the California Household Travel Survey, the University of California Riverside College of Engineering-Center for Environmental Research and Technology, the UCLA Anderson Forecast, California Department of Finance, California Board of Equalization, California Energy Commission, and U.S. Department of Energy - Energy Information Administration. EMFAC2021 accounts for updated fleet characterization, vehicle activity profile, and socio-econometric forecasting data; new vehicle testing data for emission rates; updated assumptions on the Advanced Clean Truck regulation and Innovative Clean Transit regulation; and implementation of new regulations and policies including the SAFE Vehicles Rule. Projected emissions from all vehicle types on the SJCOG transportation network for the year 2046 under proposed 2022 RTP/SCS conditions were compared with emissions estimated for baseline year 2016. For the purposes of this analysis, a 2016 baseline is used to match the SJCOG transportation modeling base line. This allows an accurate, *apples to apples* comparison to the same baseline year. This baseline is consistent with the baseline used in SJCOG's Sustainable Communities Strategy, and as such is more reflective of the comparative analysis made within the SCS than if data from a different year was used. Pursuant to Section 15125(a)(1) of the *State CEQA Guidelines,* although the analysis baseline will normally reflect physical environmental conditions as they exist at the time the notice of preparation is published, "where necessary to provide the most accurate picture practically possible of the project's impacts, a lead agency may define existing conditions by referencing historic conditions." SJCOG has elected to do so here, for the reasons just described.

Total transportation related GHG emissions were evaluated using the Total Daily VMT (see Section 4.2, *Air Quality*) with emissions reported in terms of CO_2e. For the purposes of evaluating consistency with the SB 32 target, 2005 VMT data from SJCOG's 2018 RTP/SCS was used to back-calculate estimated 1990 emissions levels pursuant to CARB's guidance to assume 1990 emissions levels are roughly equivalent to a 15 percent reduction from baseline 2005 emissions levels (CARB 2008). In addition, for the SB 32 consistency analysis, emissions were calculated in terms of CO_2, which was used as a proxy to indicate the estimated percent change in GHG emissions levels between 1990 and 2030.

SB 375 Analysis

To determine whether the proposed 2022 RTP/SCS would allow SJCOG to meet its SB 375 reduction targets, per capita CO_2 emissions were calculated by multiplying the emission factors by the VMT from passenger vehicles and dividing by the region's population. For the purposes of this analysis, the year 2005 is used as the baseline year per the requirements of SB 375. In accordance with CARB

guidance, EMFAC2014 was utilized for SB 375 modeling for the proposed 2022 RTP/SCS to provide a consistent comparison of per capita CO_2 emissions with the SB 375 targets (CARB 2019). Furthermore, per CARB guidance, off-model adjustment factors related to the SAFE Rule were not applied in the SB375 analysis because EMFAC2014 does not account for the impact of light duty ZEV and GHG emissions standards when used in SB 375 mode (CARB 2020a).

The EMFAC model generates an output of CO_2 emissions, which were used as the overall indicator of GHG emissions associated with passenger vehicles. The CO_2 emissions associated with vehicle starts are accounted for in the EMFAC model based on the distribution of vehicle starts by vehicle classification, vehicle technology class, and operating mode. EMFAC adds these vehicle starts to the running emissions to compute total on-road mobile source emissions.

Consistency with SB 32, the 2017 Scoping Plan, EO S-3-05, and EO B-55-18

Meeting the goals of SB 375 does not guarantee consistency with SB 32 and the 2017 Scoping Plan. To determine that a project would not conflict with the State's ability to achieve the SB 32 target and its associated 2017 Scoping Plan, the proposed 2022 RTP/SCS would need to achieve substantial progress toward achieving the reduction target. Mobile source emissions were calculated to determine regionwide GHG emissions with implementation of the proposed 2022 RTP/SCS. If implementation of the proposed 2022 RTP/SCS would achieve substantial progress toward the emissions reduction targets established by SB 32, then impacts related to consistency with SB 32 would not be considered significant.

At this time, the State Legislature has codified a target of reducing emissions to 40 percent below 1990 emissions levels by 2030 (SB 32) and has developed the 2017 Scoping Plan to demonstrate how the State will achieve the 2030 target and make substantial progress toward the 2050 goal of an 80 percent reduction in 1990 GHG emission levels set by EO S-3-05. In EO B-55-18, which identifies a new goal of carbon neutrality by 2045, CARB has been tasked with including a pathway toward the EO B-55-18 carbon neutrality goal in the next Scoping Plan update. While state and regional regulators of energy and transportation systems, along with the State's Cap-and-Trade program, are designed to be set at limits to achieve most of the reductions needed to attain the State's long-term targets, local governments can do their fair share toward meeting the State's targets by siting and approving projects that accommodate planned population growth and projects that are GHG-efficient. At this time, CARB has not adopted a plan that establishes a pathway to achieving the State's long-term targets under EO S-3-05 and EO B-55-18; therefore, these targets are not used as thresholds of significance in this analysis.

Instead, the Association of Environmental Professionals (AEP) Climate Change Committee recommends that CEQA GHG analyses evaluate project emissions in light of the trajectory of state climate change legislation and assess their "substantial progress" toward achieving long-term reduction targets identified in available plans, legislation, or EOs (AEP 2016). Consistent with AEP Climate Change Committee recommendations, GHG impacts are analyzed using a threshold based on the State's 2030 target, which evaluates whether the project would impede "substantial progress" toward meeting the reduction goals identified in SB 32, EO S-3-05, and EO B-55-18. Because SB 32 is considered an interim target toward meeting the 2045 and 2050 State goals, consistency with SB 32 is considered to be contributing substantial progress toward meeting the State's long-term 2045 and 2050 goals. Avoiding interference with, and making substantial progress toward, these long-term State targets is important because these targets have been set at levels that achieve California's share of international emissions reduction targets that will stabilize global climate change effects and avoid the adverse environmental consequences of climate change (EO B-

55-18). Furthermore, these targets will depend on substantial technological innovation in GHG emission reduction measures and changes in legislation and regulations that will need to occur over the next 25 to 30 years as have occurred over the past 16 years to meet the 2020 target set by AB 32. Therefore, if the proposed 2022 RTP/SCS is consistent with the SB 32 target, the proposed 2022 RTP/SCS would also achieve substantial progress toward climate-stabilizing targets set forth by EOs S-3-05 and B-55-18 and would be consistent with these long-term goals.

b. Project Impacts and Mitigation Measures

The following section discusses impacts and mitigation measures that may be associated with transportation projects and the land use scenario contained within the proposed 2022 RTP/SCS. Section 4.9.3(c) summarizes the impacts associated with capital improvement projects in the proposed 2022 RTP/SCS. Due to the programmatic nature of the proposed 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvement projects and future projects under the land use scenario envisioned by the proposed 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1:	Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. An increase that exceeds the following threshold would be considered a significant impact: a. A net increase in GHG emissions by 2046 compared to existing baseline conditions

Impact GHG-1 CONSTRUCTION OF THE TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD GENERATE GHG EMISSIONS THAT MAY HAVE A SIGNIFICANT IMPACT ON THE ENVIRONMENT. IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.

Construction activities associated with transportation improvement projects and future land use projects envisioned by the proposed 2022 RTP/SCS would generate temporary short-term GHG emissions primarily due to the operation of construction equipment and truck trips. GHG emissions from construction can vary depending on the level of activity, the specific operations taking place, the equipment being operated and other factors. However, because such emissions are dependent on the characteristics of individual development projects, construction-related emissions are speculative at the RTP/SCS level. At the program-level of analysis, it is not feasible to quantify the amount of emissions expected from implementation of the proposed 2022 RTP/SCS. This is due to the variability in the extent of construction based on site conditions throughout the SJCOG region and the lack of project details needed to conduct such an analysis. Therefore, this analysis includes a qualitative analysis of potential GHG emissions from construction activity associated with projected land use development and proposed transportation projects.

Construction activity tends to be temporary in nature and would be expected to occur throughout the planning period of the proposed 2022 RTP/SCS. During construction activities, GHG emissions would be emitted from vehicular travel to and from the worksites and the operation of construction equipment such as graders, backhoes, and generators. Site preparation and grading typically generate the greatest amount of emissions due to the intensive use of grading equipment and soil hauling. The level of GHG emissions from the construction of any one project or of all projects combined would be primarily dependent on the particular type, size, quantity, engine type, fuel type, and fuel efficiency of the equipment and the duration of their operation at the construction

site or in the region. Construction activities generally result in annual GHG emissions that represent a small proportion of total annual GHG emissions from operational sources such as transportation and land use emissions. For example, the Southern California Association of Governments (SCAG) noted in their 2020-2045 RTP/SCS PEIR that total construction-related emissions typically account for less than 0.3 percent of total GHG emissions for the entire SCAG region (SCAG 2020).

Construction activities generally result in annual GHG emissions that represent a small proportion of total annual GHG emissions, and implementation of the proposed 2022 RTP/SCS would result in an overall net reduction in long-term transportation-related GHG emissions in 2046 when compared to baseline 2016 conditions (refer to Impact GHG-2). Nonetheless, construction activities would still result in GHG emissions would result in GHG emissions exceeding the 2016 baseline, which would constitute a significant impact. Therefore, this analysis identifies the following mitigation measures that should be implemented for individual construction projects to reduce impacts related to GHG emissions.

Mitigation Measures

For all transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measure developed for the proposed 2022 RTP/SCS where applicable for transportation projects generating construction-related GHG emissions. Cities and the County can and should implement this measure, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project-specific environmental documents may adjust this mitigation measure as necessary to respond to site-specific conditions.

GHG-1 Construction GHG Reduction Measures

The project sponsor shall incorporate the most recent GHG emission reduction measures for off-road construction vehicles during construction. The measures shall be noted on all construction plans, and the implementing agency shall perform periodic site inspections. Current GHG-reducing measures include the following:

- Use of diesel construction equipment meeting CARB's Tier 4 certified engines wherever feasible for off-road heavy-duty diesel engines and comply with the State Off-Road Regulation. Where the use of Tier 4 engines is not feasible, Tier 3 certified engines shall be used; where the use of Tier 3 engines are not feasible, Tier 2 certified engines shall be used;
- Use of on-road heavy-duty trucks that meet CARB's 2007 or cleaner certification standard for on-road heavy-duty diesel engines, and comply with the State On-Road Regulation;
- Minimizing idling time (e.g., five-minute maximum). Signs shall be posted in the designated queuing areas and or job sites to remind drivers and operators of the five-minute idling limit;
- Use of electric-powered equipment in place of diesel-powered equipment when feasible;
- Use of alternatively fueled or catalyst-equipped diesel construction equipment when feasible, to the extent electric powered equipment is not feasible;
- Substitution of gasoline-powered in place of diesel-powered equipment, when neither electric-powered equipment or alternatively fueled or catalyst-equipped diesel equipment is feasible; and,
- Incentives for construction workers to carpool and/or use electric vehicles to commute to and from the project site.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate.

Significance After Mitigation

Implementation of Mitigation Measure GHG-1 would reduce short-term construction emissions from individual projects and thus reduce the severity of impacts by requiring best practices for exhaust emissions via readily available, lower-emitting diesel equipment, and/or equipment powered by alternative cleaner fuels (e.g., propane) or electricity, as well as on-road trucks using particulate exhaust filters. Implementation of Mitigation Measures AQ-2(b) and AQ-2(c) would also reduce GHG emissions from the proposed 2022 RTP/SCS. However, these mitigation measure may not be feasible or effective for all projects. Therefore, this impact would remain significant and unavoidable. No additional mitigation measures to reduce this impact to less than significant levels are feasible.

Threshold 1:	Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. An increase that exceeds the following threshold would be considered a significant impact: a. A net increase in GHG emissions by 2046 compared to existing baseline conditions

Impact GHG-2 PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD RESULT IN A NET INCREASE IN GHG EMISSIONS BY 2046 COMPARED TO THE EXISTING BASELINE CONDITIONS AND WOULD THEREFORE HAVE A SIGNIFICANT IMPACT ON THE ENVIRONMENT. IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.

Transportation-Related Emissions

Table 4.9-3 compares the total transportation-related emissions from all vehicle classes for baseline (2016) conditions and with implementation of the proposed 2022 RTP/SCS. As presented in Table 4.9-3, implementation of the proposed 2022 RTP/SCS would result in a net reduction in per capita emissions of 1.28 MT of CO_2e per person per year and a net reduction in total emissions of 130,766 MT of CO_2e per year, compared to baseline (2016) conditions. The estimated reduction in total mobile source emissions is primarily due to stricter fuel efficiency and vehicle emissions standards such as the CAFE standards that will phase in over the planning period as reflected in EMFAC2021 emission factors. In addition, improved circulation networks and multimodal transportation initiatives outlined in the proposed 2022 RTP/SCS would reduce per capita VMT.

Because the proposed 2022 RTP/SCS would result in a net decrease in overall transportation-related emissions in the SJCOG region, operational activities under the plan would not generate GHG emissions that may have a significant impact on the environment, and impacts would be less than significant.

Table 4.9-3 Proposed 2022 RTP/SCS Net Change in Transportation-Related Emissions (2016-2046)

Scenario	Total Emissions (MT of CO_2e/year)	Per Capita Emissions (MT of CO_2e/person/year)[1]
2016 Baseline	3,196,610	4.37
2046 with Proposed 2022 RTP/SCS	2,837,622	2.85
Net Change from Baseline	**(358,988)**	**(1.51)**
Threshold of Significance	> 0	> 0
Threshold Exceeded?	No	No

( ) denotes a negative number.

MT = metric tons; CO_2e = carbon dioxide equivalent

[1] The baseline (2016) population of the SJCOG region is 732,185 persons, and the future (2046) population is forecast to be 994,257 persons (SJCOG 2020).

Source: Appendix A

Other Land Use Development Emissions

In addition to the transportation-related GHG emissions shown in Table 4.9-3, land use projects envisioned by the land use scenario in the proposed 2022 RTP/SCS would also result in GHG emissions due to sources such as electricity and natural gas consumption. Residential, commercial, agricultural, and other land uses would result in GHG emissions; however, data is not available to quantify impacts from such sources. For instance, agricultural machinery and processes have unique emission factors, and GHG emissions must be calculated using precise information regarding specific processes. Furthermore, emissions from land use projects cannot be feasibly quantified at this time because details about future land use projects and their timing are unknown at this time. Therefore, because future land use projects would represent new sources of GHG emissions, it can be conservatively estimated that total GHG emissions from the land use scenario envisioned by the proposed 2022 RTP/SCS would increase over the planning period. Although per capita emissions associated with electricity and natural gas consumption, water and wastewater conveyance and treatment, and solid waste disposal are anticipated to decline, primarily as a result of increasingly stringent iterations of State building code standards (specifically, the California Energy Code and the California Green Building Standards Code), total emissions may increase due to population growth and future land use projects. As a result, impacts of land use projects implementing the proposed 2022 RTP/SCS would be significant.

Mitigation Measures

Cities and the County can and should implement the following mitigation measure, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project-specific environmental documents may adjust this mitigation measure as necessary to respond to site-specific conditions.

GHG-2 Land Use Project Energy Consumption and Water Use Reduction Measures

For land use projects under their jurisdiction, cities and the County can and should implement measures to reduce energy consumption, water use, solid waste generation, and VMT, all of which contribute to GHG emissions. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. These measures include, but are not limited to:

- Require new residential and commercial construction to install solar energy systems or be solar-ready
- Require new residential and commercial development to install low flow water fixtures
- Require new residential and commercial development to install water-efficient drought-tolerant landscaping, including the use of compost and mulch
- Require new development to exceed the applicable Title 24 energy-efficiency requirements
- Require new development to be fully electric
- Require new residential and commercial development to offer information on recycling, composting, and disposal of household hazardous waste and e-waste
- Require new development to implement circulation design elements in parking lots for no-residential uses to reduce vehicle queuing and improve the pedestrian environment

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for land use projects are cities and the County. This mitigation measure can and should be applied during project permitting and environmental review and implemented during project operation, as applicable.

Significance After Mitigation

If implementing agencies adopt and require the mitigation described above, impacts would be reduced because energy, water use, solid waste generation, and VMT-related GHG emissions from land use projects would be reduced. However, implementation of project-level GHG-reducing measures may not be feasible and cannot be guaranteed on a project-by-project basis. Therefore, this impact would remain significant and unavoidable. No additional feasible mitigation measures are available that would ensure no net increase in GHG emissions compared to existing baseline conditions.

Threshold 2:	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Any conflict with the following thresholds would be considered a significant impact: a. Conflict with regional SB 375 per capita passenger vehicle CO_2 emission reduction targets of 16 percent by 2035 from 2005 levels

Impact GHG-3 THE TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD NOT CONFLICT WITH REGIONAL SB 375 PER CAPITA PASSENGER VEHICLE CO_2 EMISSION REDUCTION TARGETS OF 16 PERCENT BY 2035 FROM 2005 LEVELS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

One of the goals of SB 375 is to reach the per capita GHG emissions reduction targets for passenger vehicles set by CARB through an integrated land use, transportation, and housing plan. Achievement of this goal is an objective of the proposed 2022 RTP/SCS. The target from CARB, analyzed in this EIR, is identified as a 16 percent reduction in per capita passenger vehicle emissions from 2005 levels by 2035.[4] Table 4.9-4 presents per capita passenger vehicle emissions for 2035 as compared to the 2005 baseline. The per capita transportation-related emissions from passenger vehicles

[4] The SB 375 target for 2020 is not utilized herein as a threshold of significance because the 2022 RTP/SCS would apply only to future transportation and land use planning from the year of adoption (anticipated to be 2022) forward.

include off-model adjustments that represent a reasonable level effect of the transportation programs included in the proposed 2022 RTP/SCS.

Table 4.9-4 Per Capita Passenger Vehicle CO_2 Emissions Comparison

	Percent Change in Per Capita CO_2 Emissions (lbs/day)		
	2005 Baseline (per SB 375)	2035	2046
Per Capita Passenger Vehicle Emissions[1]	20.4	17.1	17.0
Percent Change from in Per Capita GHG Emissions from 2005		-16.4%	-16.8%
SB 375 Target		-16%	n/a[2]
SB 375 Target Met?		Yes	n/a[2]

CO_2 = carbon dioxide; lbs = pounds; SB = Senate Bill

Source: Appendix A

[1]Per capita passenger vehicle emissions for 2035 and 2046 derived from reduction percentages provided by SJCOG.

[2]SB 375 targets have not been adopted for post-2035 years.

As shown in Table 4.9-4, implementation of the proposed 2022 RTP/SCS in the year 2035 would result in a decrease of per capita passenger vehicle CO_2 emissions by 16.4 percent compared to 2005 levels. Therefore, implementation of the proposed 2022 RTP/SCS would achieve the SB 375 GHG reduction target for SJCOG of 16 percent by 2035, and the proposed 2022 RTP/SCS would therefore be consistent with SB 375. Impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Threshold 3: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Any conflict with the following thresholds would be considered a significant impact:

b. Conflict with state's ability to achieve SB 32 GHG reduction target, which aims to reduce statewide emissions to 40 percent below 1990 levels by 2030

c. Conflict with state's ability to achieve EO S-3-05 GHG reduction 2050 goal, which aims to reduce statewide emissions to 80 percent below 1990 levels by 2050 and EO B-55-18; or

d. Conflict with applicable local GHG reduction plans

Impact GHG-4 IMPLEMENTATION OF THE PROPOSED 2022 RTP/SCS WOULD CONFLICT WITH THE STATE'S ABILITY TO ACHIEVE SB 32, EOS S-3-05 AND B-55-18, AND APPLICABLE LOCAL GHG REDUCTION PLAN TARGETS AND GOALS. IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.

2017 Scoping Plan

The proposed 2022 RTP/SCS would implement a suite of transportation improvement projects and facilitate a land use scenario that is consistent with the transportation sustainability goals of the 2017 Scoping Plan. The land use scenario envisioned by the proposed 2022 RTP/SCS concentrates

the forecasted growth in population and employment in established neighborhoods, job centers, urban arterials, and high quality transit areas in an effort to reduce VMT. Active transportation projects would implement design policies that prioritize transit, biking, and walking throughout the SJCOG region including but not limited to the cities of Stockton, Tracy, Escalon, Manteca, Lodi, Lathrop, and Ripon. Active Transportation projects would increase the number, safety, and connectivity, and attractiveness of biking and walking facilities by adding sidewalks, trails, bike lanes, crosswalks, intersection improvements, and signage throughout the SJCOG region. Furthermore, the proposed 2022 RTP/SCS includes transit projects designed to maintain, enhance, and expand transit services offered by agencies in the SJCOG region, including, but not limited to, the San Joaquin Regional Transit District (RTD) and municipal transit divisions. Proposed 2022 RTP/SCS projects include electric bus procurement by RTD, enhanced Dial-A-Ride operations by the City of Ripon, Compressed Natural Gas Station expansion by the City of Lodi, transit facility improvements regionwide, and new transit lines added to systems regionwide. Transit projects would increase the availability of low carbon mobility options in the region, thereby contributing to the 2017 Scoping Plan's goals of increasing the penetration of zero emission vehicles in non-light-duty sectors and electrifying the transportation sector. Therefore, the proposed 2022 RTP/SCS is consistent with the goals and strategies of the 2017 Scoping Plan.

SB 32

The SB 375 targets are a key element of CARB's 2017 Scoping Plan. However, the 2017 Scoping Plan states, "Stronger SB 375 GHG reduction targets [adopted in 2018] will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals" (CARB 2017). Therefore, consistency with the SB 375 target does not necessarily equate to consistency with SB 32 and the 2017 Scoping Plan. This analysis hypothetically assumes that the proposed 2022 RTP/SCS would be required to achieve the same proportional GHG reductions as the state by the year 2030 (i.e., a 40 percent reduction in GHG emissions below 1990 levels). Although transportation related GHG emissions would decrease over the planning period, the reduction would not be sufficient to achieve the 2030 target of a 40 percent reduction below 1990 levels. As shown in Table 4.9-5, per capita transportation-related emissions would also decrease.

Table 4.9-5 Per Capita Transportation-Related Emissions (All Vehicle Classes) Compared to 1990 Levels

	Per Capita CO_2 Emissions (lbs/day)	
Scenario	Vehicle Emissions	% Change in Emissions Compared to 1990 Baseline
1990 Baseline[1, 2]	23.02	--
2005 Baseline[2]	27.16	--
2016 Baseline	25.2	-9.5%
2030 with proposed 2022 RTP/SCS[3]	19.4	-15.82%
2046 with proposed 2022 RTP/SCS	16.7	-27.64%

[1] Actual 1990 emissions are unknown but are generally assumed to be 15% below 2005 levels (CARB 2008).

Source: Appendix A

As discussed in Impact GHG-2, per capita land use emissions associated with electricity and natural gas consumption, water and wastewater conveyance and treatment, and solid waste disposal are anticipated to decline over the planning period, primarily as a result of increasingly stringent iterations of State building code standards. However, it cannot be feasibly determined that reductions in land use emissions would achieve the SB 32 target.

Therefore, although the policies, transportations projects, and land use scenario identified in the proposed 2022 RTP/SCS are designed to align transportation and land use planning to reduce transportation related GHG emissions, the proposed 2022 RTP/SCS would conflict with the State's ability to achieve the SB 32 GHG emissions reduction target, assuming that the proposed 2022 RTP/SCS is required to achieve the same proportional Statewide GHG reductions. Implementation of Mitigation Measure GHG-4 below would reduce this impact.

EOs S-3-05 and B-55-18

Because the plan would conflict with the State's ability to achieve the SB 32 GHG reduction target, it would also impede "substantial progress" toward meeting the reduction goals identified in EO S-3-05 and EO B-55-18. Implementation of Mitigation Measure GHG-4 below would reduce this impact.

Local Climate Action Plans

Four of SJCOG's member jurisdictions (the cities of Stockton, Tracy, Lodi, and Manteca) have adopted CAPs that set goals and targets for the reduction of GHG emissions, and outline policies to help achieve those goals (City of Stockton 2014; City of Tracy 2011; City of Lodi 2014; City of Manteca 2013). All of these CAPs had been adopted prior to enaction of SB 32 and thus present strategies intended to comply with the GHG emissions reduction goals recommended for local governments in the AB 32 Scoping Plan, which was aimed at reducing GHG emissions to 1990 levels by 2020 in accordance with AB 32. These CAPs are also intended to make progress toward the State's 2030 target of reducing GHG emissions by 40 percent below 1990 levels, as first set forth in EO S-3-05 in 2005 and later codified by SB 32 in 2017. In addition, the cities of Lodi and Manteca presents strategies explicitly addressing the GHG reduction goals set forth in SB 32. As discussed previously, the proposed 2022 RTP/SCS was determined to be inconsistent with the SB 32 target and EO S-3-05 and B-55-18 goals. Therefore, it would also conflict with the goals of local CAPs designed

to meet the same State goals, and impacts would be significant. The following mitigation measures would reduce this impact.

Mitigation Measures

For all transportation projects under their jurisdiction, implementing agencies shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures developed for the proposed 2022 RTP/SCS where applicable for transportation projects generating construction GHG emissions. The County of San Joaquin and cities in the SJCOG region can and should implement these measures, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions.

Implementation of Mitigation Measure GHG-2 would also reduce GHG emission from land use projects. Implementation of Mitigation Measures T-1(a) and T-1(b) in Section 4.14, *Transportation*, would further reduce GHG emissions from the proposed 2022 RTP/SCS.

GHG-4 Transportation-Related GHG Reduction Measures

The implementing agency shall incorporate the most recent GHG emission reduction measures and/or technologies for reducing VMT and associated transportation related GHG emissions. Current GHG-reducing measures include the following:

- Installation of electric vehicle charging stations beyond those required by State and local codes
- Utilization of electric vehicles and/or alternatively fueled vehicles in company fleet
- Provision of dedicated parking for carpools, vanpool, and clean air vehicles
- Provision of vanpool and/or shuttle service for employees
- Implementation of reduced parking minimum requirements
- Implementation of maximum parking limits
- Provision of bicycle parking facilities beyond those required by State and local codes
- Provision of a bicycle-share program
- Expansion of bicycle routes/lanes along the project site frontage
- Provision of new or improved transit amenities (e.g., covered turnouts, bicycle racks, covered benches, signage, lighting) if project site is located along an existing transit route
- Expansion of existing transit routes
- Provision of transit subsidies
- Expansion of sidewalk infrastructure along the project site frontage
- Provision of safe, pedestrian-friendly, and interconnected sidewalks and streetscapes
- Provision of employee lockers and showers
- Provision of on-site services that reduce the need for off-site travel (e.g., childcare facilities, automatic teller machines, postal machines, food services)
- Provision of alternative work schedule options, such as telework or reduced schedule (e.g., 9/80 or 10/40 schedules), for employees
- Implementation of transportation demand management programs to educate and incentivize residents and/or employees to use transit, smart commute, and alternative transportation options

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and counties. This mitigation measure shall, or can and should, be applied during project permitting and environmental review and implemented during project operation, as applicable.

Significance After Mitigation

If implementing agencies adopt and require the mitigation described above, impacts would be reduced because transportation related GHG emissions from transportation and land use projects would be reduced. However, implementation of project-level GHG-reducing measures may not be feasible and cannot be guaranteed on a project-by-project basis. Additionally, it is speculative at this time to forecast whether project-level GHG emission reductions would be sufficient to achieve a countywide reduction in GHG emissions of 40 percent below 1990 levels by 2030. Therefore, this impact would remain significant and unavoidable. No additional feasible mitigation measures are available that would reduce emissions to trajectories consistent with SB 32, EO S-3-05, and EO B-55-18 GHG reduction targets and goals.

c. Specific Projects that May Result in Impacts

The analysis within this section discusses the potential GHG related impacts associated with the proposed 2022 RTP/SCS. The transportation projects within the proposed 2022 RTP/SCS are evaluated herein in their entirety and are intended to improve circulation rather than cause adverse impacts. However, as described above, the proposed 2022 RTP/SCS would increase GHG emissions as a result of project construction and/or operation. These effects have been found to be significant, as described above. Any number of the proposed 2022 RTP/SCS projects that require construction equipment or include transportation improvement would presumably increase GHG emissions. Thus, no specific projects are listed in this section related to the adverse impacts on GHG emissions in the SJCOG region.

4.9.4 Cumulative Impacts

The impacts of GHG emissions are, by definition, cumulative impacts, as they add to the global accumulation of greenhouse gases in the atmosphere. The cumulative impact analysis area for GHG emissions consists of the SJCOG region, adjoining counties, and the entire State of California. The entire state is included in the analysis area because GHG emissions from the SJCOG region and adjoining counties would influence the ability for the State to achieve its GHG reduction targets. The analysis presented in Section 4.9.3, *Impact Analysis*, evaluates both plan-level impacts as well as the contribution of the proposed 2022 RTP/SCS to the existing cumulative impact related to GHG emissions, the effects of which are outlined in Section 4.9.1(c), *Potential Effects of Climate Change*.

As discussed under Impact GHG-1, construction activities associated with transportation improvement projects and future land use projects envisioned by the proposed 2022 RTP/SCS would generate temporary GHG emissions. The temporary construction GHG emissions would occur concurrent with ongoing GHG emissions in the cumulative impact analysis area, such as GHG emissions ongoing agricultural activities in surrounding Valley counties such as Stanislaus County and Merced County. As described under Impact GHG-1, construction-related GHG emissions associated with buildout under the proposed 2022 RTP/SCS would be significant even after implementation of Mitigation Measure GHG-1. Therefore, the contribution of the proposed 2022

RTP/SCS construction emissions to the cumulative impact of total GHG emissions would be cumulatively considerable, pre- and post-mitigation.

As discussed under Impacts GHG-2 through GHG-4, the transportation projects and land use scenario envisioned in the proposed 2022 RTP/SCS would also generate operational GHG emissions. Overall, implementation of the proposed 2022 RTP/SCS would reduce total regionwide mobile emissions; however, land use emissions may increase compared to existing conditions. Implementation of Mitigation Measure GHG-2 would reduce GHG emissions from land use projects, but impacts would remain significant and unavoidable. Therefore, the contribution of land use project emissions to the cumulative impact of total GHG emissions would be cumulatively considerable, pre- and post-mitigation.

The proposed 2022 RTP/SCS would not conflict with SB 375 because per capita emissions reductions would meet and exceed the regional target of a 16 percent reduction by 2035 compared to 2005 levels. However, reductions achieved by the proposed 2022 RTP/SCS would not be sufficient to achieve the 2030 target of a 40 percent reduction in overall emissions set forth by SB 32 and therefore would also be inconsistent with EO S-3-05 and B-55-18 goals. Other ongoing land uses and operation of future development in the cumulative impact analysis area would also generate GHG emissions. Implementation of Mitigation Measures GHG-2 and GHG-4 would reduce the proposed 2022 RTP/SCS impacts related to consistency with state GHG reduction targets and goals; however, emissions would remain in exceedance of applicable significance thresholds. Therefore, the proposed 2022 RTP/SCS would have a cumulatively considerable contribution to the cumulative impact of inconsistency with state GHG reduction targets and goals, both pre- and post- mitigation.

This page intentionally left blank.

4.10 Hazards and Hazardous Materials

This section analyzes impacts related to hazardous materials and airport safety hazards in the SJCOG region. Impacts related to exposure to excessive aviation related noise are discussed in detail in Section 4.13, *Noise*, and impacts related to impairment or interference of emergency response or evacuation plans are discussed in Section 4.14, *Transportation*. Impacts related to wildfire hazards are discussed in Section 4.16, *Wildfire*.

4.10.1 Setting

Overview of Hazardous Materials and Waste

The term "hazardous material" is defined in the State of California's Health and Safety Code (HSC), Chapter 6.95, Section 25501(o) as:

> Any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste, and any material that a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

Hazardous waste is hazardous material generated, intentionally or unintentionally, as a byproduct of some process or condition. Hazardous wastes are defined in California HSC Section 25141(b) as wastes that:

> …because of their quantity, concentration, or physical, chemical, or infectious characteristics, [may either] cause, or significantly contribute to an increase in mortality or an increase in serious illness [or] pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

According to the U.S. Environmental Protection Agency (USEPA), waste may be considered hazardous under the Resource Conservation and Recovery Act (RCRA, the primary Federal hazardous materials law) if it is specifically listed as known hazardous waste or if it meets the one or more of the following characteristics of a hazardous waste:

- **Toxicity.** Poisonous, harmful when ingested or absorbed
- **Ignitability.** Capable of being ignited by open flame, liquids with flash points[1] below 60 degrees Celsius, non-liquids that cause fire through specific conditions, ignitable compressed gases and oxidizers
- **Corrosivity.** Capable of corroding other materials, aqueous wastes with a pH of 2 or less or greater than or equal to 12.5
- **Reactivity.** May be unstable under normal conditions, may react with water, may give off toxic gases or may be capable of detonation or explosion under normal conditions or when heated

[1] Flash point is the lowest temperature at which the vapors of a volatile combustible substance ignite in the air when exposed to flame.

Generation and Disposal of Hazardous Materials and Waste

Many chemicals used in household cleaning, construction, light and heavy industry, dry cleaning, landscaping, and automotive maintenance and repair are considered to generate hazardous materials and waste. Additionally, in some cases, past industrial or commercial uses on a site may have resulted in spills or leaks of hazardous materials and petroleum that have caused contamination of the underlying soil and groundwater. Federal and state laws require that soils and groundwater having concentrations of contaminants that are higher than certain acceptable levels are handled and disposed as hazardous waste during excavation, transportation, and disposal. The California Code of Regulations (CCR), Title 22, Sections 66261.20-24 contains technical descriptions of characteristics that would cause a soil to be classified as a hazardous waste. Hazardous materials require special methods of disposal, storage, and treatment, and the release of hazardous materials requires an immediate response to protect human health and safety, and the environment. Improper disposal can harm the environment and people who work in the waste management industry.

Businesses that handle or generate hazardous materials within the SJCOG region are monitored by USEPA; the Central Valley Regional Water Quality Control Board (CVRWQCB); the San Joaquin County Environmental Health Department (EHD); Local Enforcement Agency (LEA) programs; and San Joaquin Valley Air Pollution Control District (Valley Air District). Generators of hazardous waste fall into two categories: large-quantity generators (LQG) and small-quantity generators (SQG). An LQG is defined as a person or facility generating more than 2,200 pounds of hazardous waste per month. An SQG is defined as generating greater than 100 kilograms (kg) and less than 1,000 kg (2,200 pounds) of hazardous waste per month. LQGs include industrial and commercial facilities, such as manufacturing companies, petroleum refining facilities and other heavy industrial businesses.

LQGs must comply with federal and state requirements for managing hazardous waste. LQGs need an U.S. EPA identification number that is used to monitor and track hazardous waste activities. SQGs include facilities such as service stations, automotive repair, dry cleaners, and medical offices. The regulatory requirements for SQGs are less stringent than the requirements for LQGs; however, SQGs must also obtain an U.S. EPA identification number, which must be used for traceability on all hazardous waste documentation. Pursuant to federal law (40 CFR 262.41-43), all such generators must register with U.S. EPA for record-keeping and reporting.

Transportation of Hazardous Materials and Waste

Hazardous materials, hazardous wastes, medical waste, and petroleum products are a subset of the goods routinely shipped along the transportation corridors in the SJCOG region. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by the CalEPA Department of Toxic Substances Control (DTSC). The DTSC maintains a list of active registered hazardous waste transporters throughout California, and the California Department of Public Health regulates the haulers of hazardous waste. There are 30 registered hazardous waste transporters based in the SJCOG region (DTSC 2021).

Transportation of hazardous materials and wastes within the SJCOG region occurs through a variety of modes: truck, rail, air, ship, and pipeline. Transportation of hazardous materials by truck is regulated by the DOT. The DOT's Federal Motor Carrier Safety Administration identifies several highways and roads in the SJCOG region as a Hazardous Materials Route in its National Hazardous

Materials Route Registry. Federally designated Hazardous Materials Routes are listed in Table 4.10-1.

Table 4.10-1 Federally Designated Hazardous Routes in the SJCOG Region

Road or Highway Name		
Interstate Highways		
▪ Interstate 5	▪ Interstate 205	▪ Interstate 580
State Highways		
▪ Highway 4	▪ Highway 120	▪ Highway 132
▪ Highway 26	▪ Highway 12	▪ Route 33
▪ Highway 88	▪ Highway 99	
County and City Streets		
▪ Ahern Road	▪ Kasson Road	▪ Patterson Pass
▪ Byron Road	▪ Bird Road	
▪ Grant Line Road	▪ Chrisman Road/11th Street	

Source: Federal Motor Carrier Safety Administration 2020

In 2015, flammable liquids accounts for the largest share of hazardous materials shipped nationally by tonnage and value. Transport by truck accounted for approximately half of the hazardous materials transported in the nation, with pipelines handling another 24 percent. Although trucks carry the most hazardous material by tonnage, the total distance traveled by hazardous materials by truck (ton-miles) is lower than any other mode, due to the short distances trucks generally carry materials over (BTS 2021). Considering the abundance of roads in the SJCOG region compared to rail and pipelines, trucks are generally responsible for transporting most hazardous materials within the SJCOG region. According to the DOT's Pipeline and Hazardous Materials Safety Administration, highway transport consistently accounts for the largest share of reportable accidents or incidents each year in California. For example, from 2011 through 2020, truck transport accounted for between 80 and 90 percent of the reportable incidents in the State, while rail and air transport accounted for the rest 10 percent. Air transport incidents come in second, with freight third and pipeline incidents occurring very rarely (PHMSA 2020). While hazardous waste incidents account for a small percentage of overall highway incidents, the impact of these incidents can be more severe due to the nature of the material(s) involved. However, about two thirds of all hazardous material spills from all modes of transport do not occur during transport; they occur during loading and unloading of the materials (BTS 2021).

The transport of hazardous materials by rail is also regulated by DOT. Freight railroads have employee safety training requirements and operating procedures that govern the handling and movement of hazardous goods, including crude oil. Federal regulations and self-imposed safety practices dictate train speeds, equipment and infrastructure inspections, and procedures for how to handle and secure trains carrying hazardous materials. The freight rail industry provides instruction to local public safety officials at the Transportation Technology Center's Security and Emergency Response Training Center, a training facility where cargo trucks and freight trains are routinely used in large-scale hazardous response trainings. Individual railroads conduct additional local training for first responders. Freight railroads also work with State emergency planning committees and local first responders to develop municipal emergency response plans. In accordance with a February 2014 agreement between the DOT and Association of American Railroads, railroads have developed an inventory of emergency response resources and provided the DOT with information on the

deployment of those resources. This information is available upon request to appropriate emergency responders. A list of the rail facilities in the SJCOG region is provided in Chapter 2.

Pipelines, primarily underground, are used to transport a variety of potentially hazardous substances, including natural gas, crude oil, and other petroleum products throughout the SJCOG region. For example, Pacific Gas & Electric (PG&E) maintains and operates a natural gas pipeline that is roughly parallel to Interstate 5 through most of the SJCOG region, passing through the city of Stockton, and Phillips 66 Pipeline operates a crude oil pipeline parallel to Interstate 580 in the southwestern portion of the SJCOG region. Most of the pipelines in the SJCOG region run through urban areas, although some that are segments of longer intra- or interstate lines run through rural and agricultural areas (NPMS 2021). The Transportation Research Boards' 2004 report *Transmission Pipelines and Land Use: A Risk-Informed Approach,* encouraged the use of zoning regulations to minimize casualties in the event of a catastrophic pipeline rupture. Possible land use techniques include, for example, establishing setbacks (the Report emphasized using the American Petroleum Institutes' recommended setbacks of 50 feet from petroleum and hazardous liquids lines for new homes, businesses, and places of public assembly; 25 feet for garden sheds, septic tanks, and water wells; and 10 feet for mailboxes and yard lights; as the vast majority of pipeline spills are caused by homeowner or contractor digging), regulating or prohibiting certain types of structures and uses near transmission pipelines; and encouraging, through site and community planning, other types of activities and facilities, such as mini-storage businesses, linear parks, and recreational paths, within or in the vicinity of pipeline rights-of-way (TRB 2004).

The Port of Stockton is located within the SJCOG region, on the Stockton Deepwater Ship Channel, 80 miles from the Pacific Ocean along the San Joaquin River. The Port owns and operates a major, diversified intermodal transportation center that encompasses more than 4,200 acres of operating area and real estate. The Port of Stockton has over 11,000 lineal feet of waterside docking for berthing and cargo operations of up to 17 vessels, as well as 1.1 million square feet of dockside transit sheds and shipside rail trackage, with 60 miles of rail track that can be served by Union Pacific or Burlington Northern Santa Fe (BNSF) Railroads. Existing facilities include 7.7 million square feet of warehousing for both dry bulk and general cargo, which compose the largest percentage of the Port's dockside operations. Stockton's deepwater channel has an average depth of 35 feet. Panamax-sized vessels with load capacity up to 45,000-ton dead-weight class, which are fully loaded, and partially loaded 80,000-ton dead-weight vessels can be accommodated. There is no width restriction of vessels and ships up to 900 feet in length can navigate the Stockton Ship Channel. The Port is stationed along the Deep Water Ship Channel next to I-5, State Route 99, and the Union Pacific and BNSF Railway. (SJCOG 2018).

Hazardous Material Use and Hazardous Material Sites

Many activities in the SJCOG region involve the use, storage, or production of hazardous materials. The use of hazardous materials is commonplace in commercial, industrial, and manufacturing activities, and many businesses within the SJCOG region are permitted to handle and transport hazardous materials. There are historic and existing land uses that have generated hazardous waste as part of daily business operations. LQGs and SQGs include such commercial uses as painters, dry cleaners, automotive service stations, medical offices, and industrial uses such as metal fabrication, scrap yards, railways, cement companies, food manufacturing, chemical manufacturing, landfill and waste disposal, and electrical substations. In addition, older structures may contain building materials that are considered hazardous, such as asbestos and lead-based paint. In general, these historic and current uses and building materials are located throughout the SJCOG region. The

County Environmental Health Department oversees permitting and regulation of hazardous material generators in the SJCOG region and currently identifies 1,150 facilities that they are actively managing (San Joaquin County EHD 2021).

California Government Code Section 65962.5 requires the California Environmental Protection Agency (CalEPA) to prepare an annual Hazardous Waste and Substances List, commonly referred to as the Cortese List. The addition or inclusion of a site on the Cortese List has bearing on the local permitting process and compliance with CEQA. For example, projects proposed at a site on the Cortese List are not eligible for categorical exemptions to CEQA per Section 15300.2(e) of the State CEQA Guidelines. The Cortese List is not maintained as a centralized list, however, a variety of governmental data sources identify sites where hazardous substances may have been released or may have created a hazardous condition on-site. These include:

- DTSC Active Transporter Registry
- DTSC EnviroStor Database tracking hazardous waste facilities and sites with known contamination or that are under investigation
- State Water Resources Control Board (SWRCB) GeoTracker database of sites that require cleanup, such as leaking underground storage tank (UST) sites and landfills
- California Office of Emergency Services (OES) Hazardous Materials Spill Notification database on reported hazardous material accidental releases or spills
- DOT Hazardous Materials Incident Report System database on hazardous material spill incidents
- California Department of Resources Recycling and Recovery's (CalRecycle) Solid Waste Inventory System database of active and closed solid waste sites
- USEPA Envirofacts database of Resource Conservation and Recovery Act (RCRA) sites and other hazardous sites including Superfund and brownfield sites
- USACE list of Formerly Used Defense Sites for closed or inactive military bases and facilities

All databases listed above have identified sites within the SJCOG region. The DTSC Active Transporter Registry identifies 30 registered hazardous waste transporters in the SJCOG region. The DOTs Hazardous Materials Incident Report System database identified 250 hazardous materials spill incidents in the SJCOG region between January 2006, and September 2021. Five sites in the SJCOG region are identified on the USACE list of Formerly Used Defense Sites for California. According to CalRecycle's Solid Waste Inventory System database, there are 13 active landfill, recycling, and transfer sites in the SJCOG region, an additional 33 sites that have been closed, and four that are inactive but not closed. None are currently on the CalRecycle list of sites that are violating minimum standards, and nine are operating without permits or are under notification of permit expiration.

For some databases, such as the DTSC EnviroStor and USEPA Envirofacts databases, the list of identified sites is too exhaustive to provide in its entirety for purposes of this EIR. For example, the EnviroStor identifies 357 cleanup sites in the SJCOG region including closed sites that have been fully remediated, sites where contamination is contained but land use restrictions are in place, and sites under evaluation, active remediation, or monitoring. Among these sites are Superfund sites, state response hazardous sites, contaminated soil sites, school cleanup sites and leaking UST sites. The USEPA Envirofacts database also identifies hundreds of RCRA sites in the region, most of which are also listed in the EnviroStor database. Examples of some of the RCRA sites identified in the region include gas stations, dry cleaners, automotive repair shops, medical facilities, automobile dealerships, paint stores, and trucking companies. The SWRCB GeoTracker database identifies 2,628 cleanup sites, most of which represent remediated and closed cases, and some of which have yet to

be closed. For purposes of this EIR, it is more important to note that many sites on the Cortese list exist throughout the SJCOG region, typically within proximity to the transportation network and more densely populated areas in the region, than to list or analyze each of the hundreds or thousands of relevant sites throughout the SJCOG region.

To address the potential for documented and undocumented hazards on a site, the American Society for Testing and Materials has developed widely accepted practice standards for the preliminary evaluation of site hazards (E-1527-05). Phase I Environmental Site Assessments (ESAs) include an on-site visit to determine current conditions; an evaluation of possible risks posed by neighboring properties; interviews with persons knowledgeable about the site's history; an examination of local planning files to check prior land uses and permits granted; file searches with appropriate agencies having oversight authority relative to water quality and/or soil contamination; examination of historic aerial photography of the site and adjacent properties; a review of current topographic maps to determine drainage patterns; and an examination of chain-of-title for environmental lines and/or activity and land use limitations. If a Phase I ESA indicates the presence, or potential presence of contamination, a site-specific Phase II ESA is generally conducted to test soil and/or groundwater. Based on the outcome of a Phase II ESA, remediation of contaminated sites under federal and state regulations may be required prior to development. Phase I ESAs can also be used to identify the potential for presence of hazardous building materials in situations where older structures intended for demolition could contain lead-based paint, asbestos containing materials, mercury, or polychlorinated biphenyls (PCBs).

Naturally Occurring Asbestos

Asbestos is not a formal mineralogical term, but rather a commercial and industrial term historically applied to a group of silica-containing minerals that form long, very thin mineral fibers (termed amphiboles), which generally form in bundles, that were once widely used in commercial products. Naturally occurring asbestos includes minerals in their natural state, such as in bedrock or soils. Naturally occurring asbestos, which was identified as a toxic air contaminant by CARB in 1986, is of concern due to potential exposures to the tiny fibers that can become airborne if asbestos-bearing rocks are disturbed by natural erosion or human activities, such as road building, excavations, and other ground-disturbing activities. Once disturbed, microscopic fibers can become lodged in the lungs, which can potentially lead to serious health problems. Tulare County contains one former asbestos exploration prospect site and ultramafic rocks, such as serpentinite, which can contain asbestos fibers. Naturally occurring asbestos sites are most concentrated in the central/western area of the County (USGS 2011). In general, naturally occurring asbestos fibers do not pose a threat unless disturbed and introduced into the air as fugitive dust.

Schools

Children are particularly susceptible to long-term effects from emissions of hazardous materials. Therefore, locations where children spend extended periods of time, such as schools, are particularly sensitive to hazardous air emissions and accidental release associated with the handling of extremely hazardous materials, substances, or wastes. According to the California Department of Education (CADOE) there are 246 public and private schools in the SJCOG region (CADOE 2021). According to the San Joaquin County Office of Education, there are 14 school districts with more than 151,000 students enrolled (SJCOE 2021).

Airports

The SJCOG region contains public-use airports and seven private air facilities including hospital heliports and small agricultural airstrips. Currently, there are no operational military airfields in the SJCOG region. The six public use airports are Kingdon, Lodi, Lodi Precessi Airpark, New Jerusalem, Stockton Metropolitan, and Tracy Municipal. Only the Stockton Metropolitan Airport provides scheduled air carrier service and it is the primary regional airport.

Potential aviation related hazards to the public, in relationship to airport operations, are generally regulated by the Federal Aviation Administration (FAA), with local planning and evaluation of proposed projects (in terms of a proposed project's compatibility in relationship to air and ground operations and the safety of the public) under the authority of the applicable airport land use commission (ALUC) through an airport land use compatibility plan (ALUCP). Applicable ALUCPs to the SJCOG region are discussed in the Regulatory Setting, below.

4.10.2 Regulatory Setting

a. Federal Laws, Regulations, and Policies

The USEPA is the lead agency responsible for enforcing federal regulations that affect public health or the environment. The primary federal laws and regulations include the RCRA of 1976 and the Hazardous and Solid Waste Amendments enacted in 1984; the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA); and the Superfund Act and Reauthorization Act of 1986 (SARA). Federal statutes pertaining to hazardous materials and wastes are contained in the CFR Title 40 - Protection of the Environment.

Toxic Substances Control Act

The Toxic Substances Control Act of 1976 (15 U.S. Code Section 2601 et seq.) grants EPA the authority to develop reporting, record-keeping, and testing requirements for, as well as restrictions on, the manufacture, use, and sale of chemical substances. Pursuant to Title II of the Toxic Substances Control Act, the EPA adopted the Asbestos Model Accreditation Plan in 1994. The Model Accreditation Plan requires that all persons who inspect for asbestos-containing materials or design or conduct response actions with respect to friable asbestos obtain accreditation by completing a prescribed training course and passing an exam. Section 403 of the Toxic Substances Act establishes standards for lead-based paint hazards in paint, dust, and soil.

Resource Conservation and Recovery Act

RCRA Subtitle C regulates the generation, transportation, treatment, storage, and disposal of hazardous waste by LQGs (1,000 kilograms per month or more) through comprehensive life cycle or "cradle to grave" tracking requirements. The requirements include maintaining inspection logs of hazardous waste storage locations, records of quantities being generated and stored, and manifests of pick-ups and deliveries to licensed treatment/storage/disposal facilities. RCRA also identifies standards for treatment, storage, and disposal, which is codified in 40 CFR 260.

Comprehensive Environmental Response Compensation and Liability Act

Congress enacted CERCLA, setting up what has become known as the Superfund program, in 1980 to establish prohibitions and requirements concerning closed and abandoned hazardous waste sites; provide for liability of persons responsible for releases of hazardous waste at these sites; and

establish a trust fund to provide for cleanup when no responsible party can be identified. Generally, CERCLA authorizes two kinds of response actions:

- Short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response
- Long-term remedial response actions that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening

Superfund Amendments and Reauthorization Act

SARA amended the CERCLA in 1986, emphasizing the importance of permanent remedies and innovative treatment technologies to clean up hazardous waste sites; requiring Superfund actions to consider the standards and requirements found in other state and federal environmental laws and regulations; providing new enforcement authorities and settlement tools; increasing involvement of the states in every phase of the Superfund program; increasing the focus on human health problems posed by hazardous waste sites; encouraging greater citizen participation in making decisions on how sites should be cleaned up; and increasing the size of the trust fund to $8.5 billion. Currently the fund has approximately $3.5 billion earmarked for cleanup and remediation activities. 'Special accounts' are used to hold money levied from responsible parties to generate interest while performing remediation activities; in 2020 EPA deposited approximately $203 million into the accounts from polluters.

Hazardous Materials Transportation Act

The transportation of hazardous materials is regulated by the Hazardous Materials Transportation Act (49 CFR § 101 et seq.), which is administered by the Research and Special Programs Administration of U.S. DOT. The Hazardous Materials Transportation Act governs the safe transportation of hazardous materials by all modes. The DOT regulations that govern the transportation of hazardous materials are applicable to any person who transports, ships, or causes to be transported or shipped hazardous materials, or who is involved in any way with the manufacture or testing of hazardous materials packaging or containers. The DOT regulations govern every aspect of the movement of hazardous materials including packaging, handling, labeling, marking, placarding, operational standards, and highway routing.

Emergency Planning Community Right-to-Know Act

The Emergency Planning Community Right-to-Know Act (EPCRA), or SARA Title III, was enacted in October 1986. SARA Title III requires any infrastructure at the State and local levels to plan for chemical emergencies, including identifying potential chemical threats. Reported information is then made publicly available so that interested parties may become informed about potentially dangerous chemicals in their community. EPCRA Sections 301–312 are administered by EPA's Office of Emergency Management. EPA's Office of Information Analysis and Access implements EPCRA's Section 313 program. In California, SARA Title III is implemented through the California Accidental Release Prevention Program (CalARP).

Federal Disaster Mitigation Act

The Disaster Mitigation Act of 2000 provided a new set of mitigation plan requirements that encourage state and local jurisdictions to coordinate disaster mitigation planning and

implementation. States are encouraged to complete a "Standard" or an "Enhanced" Hazard Mitigation Plan. "Enhanced" plans demonstrate increased coordination of mitigation activities at the state level and, if completed and approved, increase the amount of funding through the Hazard Mitigation Grant Program. California's HMP is a 'Enhanced' Plan.

FAA Regulations

The primary role of the FAA is to promote aviation safety and control the use of airspace. Public use airports that are subject to the FAA's grant assurances must comply with specific FAA design criteria, standards, and regulations. Land use safety compatibility guidance from the FAA is limited to the immediate vicinity of the runway, the runway protection zones at each end of the runway, and the protection of navigable airspace. 14 CFR 77, *Safe Efficient Use and Preservation of the Navigable Airspace*, establishes the federal review process for determining whether proposed development activities in the vicinity of an airport have the potential to result in a hazard to air navigation. 14 CFR Part 77 identifies standards for determining whether a proposed project would represent an obstruction "that may affect safe and efficient use of navigable airspace and the operation of planned or existing air navigation and communication facilities." Objects that are identified as obstructions based on these standards are presumed to be hazards until an aeronautical study conducted by the FAA determines otherwise.

b. State Laws, Regulations, and Policies

California Asbestos Regulations

In 1990, CARB issued an Airborne Toxic Control Measure (ATCM), which prohibited the use of serpentine aggregate for surfacing if the asbestos content was 5 percent or more. In July 2000, CARB adopted amendments to the existing ATCM prohibiting the use or application of serpentine, serpentine-bearing materials, and asbestos-containing ultramafic rock for covering unpaved surfaces unless it has been tested using an approved asbestos bulk test method and determined to have an asbestos content that is less than 0.25 percent. In July 2001, CARB adopted a new ATCM for construction, grading, quarrying, and surface mining operations in areas with serpentine or ultramafic rocks. These regulations are codified in Title 17, Section 93105 of the CCR. The regulations require preparation and implementation of an Asbestos Dust Mitigation Plan for construction or grading activities on sites greater than 1 acre in size with known NOA soils. The air districts enforce this regulation. In October 2000, the Governor's Office of Planning and Research issued a memorandum providing guidance to lead agencies in analyzing the impacts of NOA on the environment through the CEQA review process. In November 2000, the California Department of Real Estate added a section to subdivision forms that includes questions related to NOA on property proposed for development. In 2004, as part of its school-site review program, DTSC's School Property Evaluation and Cleanup Division released interim guidance on evaluating NOA at school sites. In addition, California Health and Safety Code Section 19827.5 prohibits issuance of demolition permits by local and State agencies without assessment of the potential for the structure to contain asbestos.

Lead Regulation

The California Division of Occupational Safety and Health Administration (Cal/OSHA) lead standard for construction activities is implemented under Title 8 of the CCR. The standard applies to any construction activity that may release lead dust or fumes, including, but not limited to, manual

scraping, manual sanding, heat gun applications, power tool cleaning, rivet busting, abrasive blasting, welding, cutting, or torch burning of lead-based coatings. Unless otherwise determined by approved testing methods, all paints and other surface coatings are assumed to contain lead at prescribed concentrations, depending on the application date of the paint or coating.

California Fire Code

The California Fire Code is Chapter 9 of CCR Title 24. It is the primary means for authorizing and enforcing procedures and mechanisms to ensure the safe handling and storage of any substance that may pose a threat to public health and safety. The California Fire Code regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. The California Fire Code and the California Building Code use a hazard classification system to determine what protective measures are required to protect fire and life safety. These measures may include construction standards, separations from property lines, and specialized equipment. To ensure that these safety measures are met, the California Fire Code employs a permit system based on hazard classification.

California Accidental Release Prevention Program

The California Accidental Release Prevention (CalARP) Program addresses facilities that contain specified hazardous materials, known as "regulated substances," that, if involved in an accidental release, could result in adverse off-site consequences. The CalARP Program defines regulated substances as chemicals that pose a threat to public health and safety or the environment because they are highly toxic, flammable, or explosive.

California Unified Program Administration

The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of six environmental and emergency response programs, as listed below:

- Hazardous Materials Release Response Plans and Inventories (Business Plans)
- CalARP Program
- Underground Storage Tank (UST) Program
- Aboveground Petroleum Storage Act Program
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (tiered permitting) Programs
- California Uniform Fire Code: Hazardous Material Management Plans and Hazardous Material Inventory Statements

The state agency partners involved in the Unified Program have the responsibility of setting program element standards, working with CalEPA on ensuring program consistency, and providing technical assistance to the Certified Unified Program Agencies (CUPA). The following state agencies are involved with the Unified Program:

- CalEPA is directly responsible for coordinating the administration of the Unified Program. The Secretary of the CalEPA certifies CUPAs
- DTSC provides technical assistance and evaluation for the hazardous waste generator program including onsite treatment (tiered permitting)

- OES is responsible for providing technical assistance and evaluation of the Hazardous Material Release Response Plan (Business Plan) Program and the CalARP Programs
- The Office of the State Fire Marshal is responsible for ensuring the implementation of the Hazardous Material Management Plans and the Hazardous Material Inventory Statement Programs. These programs tie in closely with the Business Plan Program
- SWRCB provides technical assistance and evaluation for the UST program in addition to handling the oversight and enforcement for the aboveground storage tank program

The CUPA for the SJCOG region is the San Joaquin County Environmental Health Department (EHD). The EHD is responsible for implementing the federal and state laws and regulations pertaining to the handling of hazardous wastes and hazardous materials.

California Health and Safety Code

Pursuant to the California Health and Safety Code section 25150, the DTSC shall adopt, and revise when appropriate, standards and regulations for the management of hazardous wastes to protect against hazards to the public health, domestic livestock, wildlife, or the environment. Pursuant to section 25159.5, in adopting or revising standards and regulations pursuant to this chapter the Department shall, insofar as practicable, make the standards and regulations conform with corresponding regulations adopted by the USEPA pursuant to the federal act. This section does not prohibit the department from adopting standards and regulations that are more stringent or more extensive than federal regulations.

Pursuant to the Health and Safety Code section 57008, CalEPA's Office of Environmental Health Hazard Assessment, in cooperation with the DTSC and the SWRCB, shall publish a list of screening numbers for select contaminants. Screening numbers are defined as the concentration of a contaminant published by CalEPA as an advisory number. In determining screening numbers, CalEPA considers the toxicology of the contaminant, risk assessments prepared by federal or state agencies, epidemiological studies, risk assessments or other evaluations of the contaminant during remediation of a site, and screening numbers that have been published by other agencies.

California Land Environmental Restoration and Reuse Act of 2001

The California Land Environmental Restoration and Reuse Act of 2001 established California Human Health Screening Levels (CHHSLs) as a tool to assist in the evaluation of contaminated sites for potential adverse threats to human health. The CHHSLs were developed by the Office of Environmental Health Hazard Assessment. The thresholds of concern used to develop the CHHSLs are an excess lifetime cancer risk of one in 1 million and a hazard quotient of 1.0 for non-cancer health effects. The CHHSLs were developed using standard exposure assumptions and chemical toxicity values published by USEPA and CalEPA. The CHHSLs can be used to screen sites for potential human health concerns where releases of hazardous chemicals to soil gas have occurred. Under most circumstances, the presence of a chemical in soil gas at concentrations below the corresponding CHHSLs can be assumed to not pose a significant health risk to people who may live (residential CHHSLs) or work (commercial/ industrial CHHSLs) at the site.

California Multi-Hazard Mitigation Plan

The State Hazard Mitigation Plan (SHMP) represents the state's primary hazard mitigation guidance document - providing an updated analysis of the state's historical and current hazards, hazard mitigation goals and objectives, and hazard mitigation strategies and actions. The plan represents

the state's overall commitment to supporting a comprehensive mitigation strategy to reduce or eliminate potential risks and impacts of disasters in order to promote faster recovery after disasters and, overall, a more resilient state. State Hazard Mitigation Plans are required to meet the Elements outlined in FEMA's State Mitigation Plan Review Guide (revised March 2015, effective March 2016).

OES is responsible for the development and maintenance of the State's plan for hazard mitigation. The State's multi-hazard mitigation plan was last approved by the Federal Emergency Management Agency (FEMA) as an Enhanced State Mitigation Plan in 2018 (CalOES 2018). The plan is designed to reduce the effects of disasters caused by natural, technological, accidental, and adversarial/human-caused hazards. The SHMP sets the mitigation priorities, strategies, and actions for the state. The plan also describes how risk assessment and mitigation strategy information is coordinated and linked from local mitigation plans into the SHMP and provides a resource for local planners of risk information that may affect their planning area. The State of California is required to review and revise its mitigation plan and resubmit for FEMA approval at least every five years to ensure continued funding eligibility for certain federal grant programs.

California Public Resources Code 21151.4

Pursuant to Public Resources Code Section 21151.4, projects that can be reasonably anticipated to produce hazardous air emissions or handle extremely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school must consult with the potentially affected school district and provide written notification not less than 30 days prior to the proposed certification or adoption of an environmental document. Where a school district proposes property acquisition or the construction of a school, the environmental document must address existing environmental hazards, and written findings must be prepared regarding existing pollutant sources.

California Education Code

Sections 17071.13, 17072.13, 17210, 17210.1, 17213.1-3, and 17268 of the California Education Code became effective January 1, 2000. Together, they establish requirements for assessments and approvals regarding toxic and hazardous materials that school districts must follow before receiving final site approval from the DOE and funds under the School Facilities Program. These requirements are consistent with those described above for certification or adoption of an environmental document under Public Resources Code Section 21151.4.

California Education Code Section 17213(b) establishes requirements for assessments and approvals that address the potential for existing contamination on the site, and whether nearby land uses might reasonably be anticipated to emit hazardous air emissions or handle hazardous materials. Assessment of existing contamination is conducted in coordination with DTSC's School Property Evaluation and Cleanup Division, which is responsible for assessing, investigating, and cleaning up proposed school sites. This Division ensures that selected properties are free of contamination or, if the properties were previously contaminated, that they have been cleaned up to a level that protects the students and staff who will occupy a new school.

Carpenter-Presley-Tanner Hazardous Substances Account Act

The Carpenter-Presley-Tanner Hazardous Substance Account Act imposes liability for hazardous substances removal or remedial actions and requires the State Attorney General to recover from the liable person, as defined, certain costs incurred by the DTSC or any of the state's nine RWCQBs, upon the request of the DTSC or RWQCB. The act authorizes, except as specified, a party found liable for any costs or expenditures recoverable under the act for those actions to establish, as

specified, that only a portion of those costs or expenditures are attributable to the party and requires the party to pay only for that portion. If each party does not establish its liability, the act requires a court to apportion those costs or expenditures, as specified, among the defendants and the remaining portion of the judgment is required to be paid from the Toxic Substances Control Account. Existing law authorizes the money deposited in the Toxic Substances Control Account in the General Fund to be appropriated to the DTSC for specified purposes, including the payment of the costs incurred by the state for those actions.

Lempert-Keene-Seastrand Oil Spill Prevention and Response Act

The Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990 granted the Office of Spill Prevention and Response the authority to direct prevention, removal, abatement, response, containment, and cleanup efforts with regard to all aspects of any oil spill in marine waters of California. The Office of Spill Prevention and Response implements the California Oil Spill Contingency Plan, consistent with the National Contingency Plan, which pays special attention to marine oil spills and impacts to environmentally- and ecologically-sensitive areas. In 2014, the Office of Spill Prevention and Response program was expanded to cover all statewide surface waters at risk of oil spills from any source, including pipelines and the increasing shipments of oil transported by railroads.

Local Community Rail Security Act

The Local Community Rail Security Act of 2006 (Public Utilities Code Sections 7665-7667) requires all rail operators to provide security risk assessments to the California Public Utilities Commission, the Director of Homeland Security, and the Catastrophic Event Memorandum Account that describe the following:

- Location and function of each rail facility
- Types of cargo stored at or typically moved through the facility
- Hazardous cargo stored at or moved through the facility
- Frequency of hazardous movements or storage
- Description of sabotage-terrorism countermeasures
- Employee training programs
- Emergency response procedures
- Emergency response communication protocols

c. Regional and Local Laws, Regulations, and Policies

San Joaquin County General Plan

The San Joaquin County General Plan Public Health and Safety Element includes policies in an effort to minimize the impacts of man-made or natural disasters, hazardous materials, or other safety concerns. Relevant policies to the proposed 2022 RTP/SCS EIR include the following (San Joaquin County 2016):

- **Policy PHS-7.1: Minimize Hazardous Materials and Wastes.** The County shall discourage the use of hazardous materials and the creation of hazardous wastes.
- **Policy PH-7.2: Avoid Contamination of Resources.** The County shall strive to ensure that hazardous materials and wastes do not contaminate air, water, or soil resources.

- **Policy PHS-7.3: Control Hazardous Materials.** The County shall require the use, storage, and disposal of hazardous materials and wastes to comply with local, State, and Federal safety standards
- **Policy PHS-7.4: County Hazardous Waste Management Plan.** The County shall maintain and implement the County Hazardous Waste Management Plan.
- **Policy PHS-7.5: Locate Hazardous Materials Away from Populated Areas.** To the extent feasible, the County shall require proposed activities and land uses that use, store, or dispose of hazardous materials or wastes to be located away from existing and planned populated areas.
- **Policy PHS-7.6: Require Hazardous Materials Management Plans.** The County shall require businesses that use or store materials and wastes on-site to prepare Hazardous Materials Management Plans (Business Plans) that map and inventory all hazardous materials and contain contingency plans for accidents, designate an individual or individuals as emergency coordinator(s), and ensure that all employees understand the potential for accidents and the appropriate response. Plans must follow the requirements for Federal, State, and/or local defined special flood hazard areas.
- **Policy PHS-7.7: County Hazardous Materials Area Plan.** The County shall maintain and implement the County Hazardous Materials Area Plan for emergency response to a release or threatened release of hazardous material within the unincorporated County.
- **Policy PHS-7.8: Consistency with Hazardous Waste Management Plan.** The County shall require all new development to be consistent with the County Hazardous Waste Management Plan (CHWMP). Any proposed hazardous waste facility, or expansion of an existing hazardous waste facility, shall be consistent with the CHWMP.
- **Policy PHS-7.9: Require Disclosure of Hazardous Materials and Waste.** The County shall require public disclosure of hazardous materials and wastes for existing and proposed businesses.
- **Policy PHS-7.10: Household Hazardous Waste.** The County shall provide educational programs to inform the public about household hazardous waste and the proper disposal methods.
- **Policy PHS-7.11: Hazardous Materials Transportation Routes.** The County shall continue to maintain route designations for hazardous materials transport within San Joaquin County.
- **Policy PHS-7.12: Hazardous Liquids Storage Tanks.** The County shall maintain and implement hazardous material regulations for the storage of hazardous liquids in underground or aboveground storage tanks.
- **Policy PHS-7.13: Hazardous Waste Disposal Waste.** The County shall provide areas for hazardous waste disposal facilities sufficient to meet the needs of county residents and businesses.
- **Policy PHS-7.14: Legislative Support.** The County shall support legislation that would further reduce public risks associated with hazardous materials, reduce hazardous waste generation, aid in cleanup, or provide assistance for hazardous materials management.
- **Policy PHS-7.15: Site Cleanup Support.** The County shall support programs and funding for determination of sites contaminated with hazardous materials and for site cleanup.
- **Policy PHS-7.16: Hazardous Waste Property Designations.** When known, the County shall refer contaminated sites to the appropriate lead agency with established authority/jurisdiction for the required assessment and cleanup activities.

City General Plans

Local planning policies related to hazards and hazardous materials are established in each jurisdiction's General Plan, generally in the Safety Element or equivalent chapter. Safety Elements are required to address geologic hazards, fire hazards, dam failure, evacuation routes, flooding, and emergency response among other issues. For emergency services, some of the relevant policies may include coordinating with other agencies that are responsible for planning medical facilities to meet the health care needs of residents in the region, retaining hospitals, evaluating medical facility proposals, providing emergency response services, and participating in mutual-aid agreements.

Incorporated cities in the SJCOG region each have an adopted General Plan which includes a Safety Element or equivalent chapter. For projects within the municipal area of these cities these Plans would supersede the elements of the County General Plan. The most notable goals and policies of these General Plans concerning hazards and hazardous materials are listed in the following sections.

City of Lodi

The City of Lodi's Safety Element of the General Plan identifies the natural and manmade hazards that exist within the city and seeks to mitigate their potential impacts through both preventative and response measures. Relevant goals to the proposed 2022 RTP/SCS EIR include the following (City of Lodi 2010)

- **Policy S-G1**: Ensure a high level of public health and safety
- **Policy S-G2:** Prevent loss of lives, injury, illness, and property damage due to flooding, hazardous materials, seismic and geological hazards, and fire.
- **Policy SG-3**: Protect the public from disasters and provide guidance and response in the event a disaster or emergency.
- **Policy S-P10:** Require that all fuel and chemical storage tanks are appropriately constructed; include spill containment areas to prevent seismic damage, leakage, fire and explosion; and are structurally or spatially separated from sensitive land uses, such as residential neighborhoods, schools, hospitals and places of public assembly.
- **Policy S-P11:** Ensure compatibility between hazardous material users and surrounding land use through the development review process. Separate hazardous waste facilities from incompatible uses including, but not limited to, schools, daycares, hospitals, public gathering areas, and high-density residential housing through development standards and the review process.
- **Policy S-P12:** Consider the potential for the production, use, storage, and transport of hazardous materials in approving new development. Provide for reasonable controls on such hazardous materials. Ensure that the proponents of applicable new development projects address hazardous materials concerns through the preparation of Phase I or Phase II hazardous materials studies, as necessary, for each identified site as part of the design phase for each project. Require projects to implement federal or State cleanup standards outlined in the studies during construction.
- **Policy S-**P13: Regulate the production, use, storage, and transport of hazardous materials to protect the health of Lodi residents. Cooperate with the County and Lodi Fire Department in the identification of hazardous material users, development of an inspection process, and implementation of the City's Hazardous Waste Management and Hazardous Materials Area plans. Require, as appropriate, a hazardous materials inventory for project sites, including an assessment of materials and operations for any development applications, as a component of

the development environmental review process or business license review/building permit review.

- **Policy S-P14:** Work with waste disposal service provider(s) to educate the public as to the types of household hazardous wastes and the proper methods of disposal and shall continue to provide opportunities for residents to conveniently dispose of household hazardous waste.
- **Policy S-P15**: Continue to follow the County Comprehensive Airport Land Use Plan for guidelines on land use compatibility near airports, land use restrictions, and to ensure public safety.
- **Policy S-P16:** Support grade-separated railroad crossings, where feasible, and other appropriate measures adjacent to railroad tracks to ensure the safety of the community.
- **Policy S-P17**: Continue to mark underground utilities and abide by federal safe-digging practices during construction.

City of Manteca

The City of Manteca's General Plan Safety element includes policies that exist within the city that minimize the impacts of man-made or natural disasters, hazardous materials, or other safety concerns. Relevant policies to the proposed 2022 RTP/SCS EIR include the following (Manteca 2021):

- **Policy S-4.1:** Maintain an awareness of hazardous materials throughout the Manteca region.
- **Policy S-4.2:** Strictly regulate the production, use, storage, transport, and disposal of hazardous materials to protect the health and safety of Manteca residents.
- **Policy S-4.3:** As part of the development review process, consider the potential for the production, use, storage, transport, and/or disposal of hazardous materials and provide for appropriate controls on such hazardous materials consistent with federal, state, and local standards.
- **Policy S-4.4:** Use the environmental review process to comment on Hazardous Waste Transportation, Storage and Disposal Facilities proposed in the Manteca Planning Area and throughout the County to request a risk assessment and ensure that potentially significant, widespread, and long-term impacts on public health and safety of these facilities are identified and mitigated, as such impacts do not respect jurisdictional boundaries.

City of Tracy

The City of Tracy's General Plan Safety Element provides information about the risks in Tracy due to natural and human-made hazards with policies geared towards minimizing the level of risk. These policies fall under goal SA-4 which may be relevant to the 2022 RTP/SCS EIR and is stated in following way:

- Goal SA-4: Protection from the harmful effects of hazardous materials and waste.

Local Hazard Mitigation Plans

Local jurisdictions develop, adopt, and update hazard mitigation plans to establish guiding principles for reducing hazard risk, as well as specific mitigation actions to eliminate or reduce identified vulnerabilities. San Joaquin County OES's Local Hazard Mitigation Plan was last updated in November of 2017 and is currently under update for 2023. The LHMP recognized earthquakes, floods, dam inundation, landslides, and wildfire as the local natural hazards among others. The LHMP also states mitigation strategies and actions that serve as the long-term blueprint for reducing potential losses. Activities such as seismic retrofitting essential facilities and implementing erosion

and sediment control regulations are examples of specific actions which can be taken to prevent or minimize damage. Such activities have been identified for each hazard in the LHMP (San Joaquin County OES 2017).

Airport Land Use Compatibility Plans

The six public airports within the SJCOG region are: Kingdon Airport, Lodi (Lind's) Airport, Lodi (Precissi) Airpark, New Jerusalem Airport, Stockton Metropolitan Airport, and Tracy Municipal Airport. The ALUC adopted two ALUCPs for these airports. The Stockton Metropolitan ALUCP was adopted in 2016, and the other ALUCP, which covers the other five airports, was adopted in 2009. Each ALUCP establishes areas of influence within which airport operations are likely to affect land uses or land uses could affect airport operations. Safety and noise criteria are identified in the ALUCP so that land use conflicts with airport operations are minimized. Prior to amending a general plan, a local agency must "refer" the proposed action to the ALUC (Pub. Util. Code Sec. 21676, et seq.) County and city General Plans must be consistent with the applicable ALUCP (Government Code Section 65302.2).

4.10.3 Impact Analysis

a. Methodology and Significance Thresholds

Appendix G of the State CEQA Guidelines identifies criteria for determining whether a project's impacts would have a significant impact related to hazards and hazardous materials, namely an analysis of whether or not the 2022 RTP/SCS would:

1. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
2. 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.
3. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
4. 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.
5. 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, result in a safety hazard or excessive noise for people residing or working in the project area.
6. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
7. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

Impacts related to exposure to wildland fires (Criterion 7), are discussed in detail Section 4.16, *Wildfire,* under Impact WF-1.

The methodology used for the following evaluation is based on a review of documents and publicly available information about hazardous and potentially hazardous conditions in the SJCOG region to determine the potential for implementation of the 2022 RTP/SCS to result in an increased health or

safety hazard to people or the environment. This includes city and county planning documents, and hazardous materials database information maintained by various state and federal agencies, such as DTSC and SWRCB. Due to the large area of the SJCOG region, known sites of current or former contamination were not evaluated in detail, and physical surveys were not conducted. Rather, this program-level analysis is based on hazards typically associated with certain land uses and an overall understanding of the key safety concerns that could result from implementation of the 2022 RTP/SCS.

The evaluation of hazards and hazardous materials impacts reasonably assumes that the construction and development under the 2022 RTP/SCS would adhere to the latest federal, state, and local regulations, and conform to the latest required standards in the industry, as appropriate for individual projects.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with transportation projects and the land use scenario contained within the 2022 RTP/SCS. Section 4.10.3.c summarizes the impacts associated with capital improvement projects proposed in the 2022 RTP/SCS. Due to the programmatic nature of the 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following sections.

Threshold 1:	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials
Threshold 2:	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

Impact HAZ-1 TRANSPORTATION IMPROVEMENT PROJECTS AND LAND USE PATTERNS INCLUDED IN THE 2022 RTP/SCS MAY FACILITATE THE ROUTINE TRANSPORT, USE, OR DISPOSAL OF HAZARDOUS MATERIAL, AND MAY RESULT IN REASONABLY FORESEEABLE UPSET AND ACCIDENT CONDITIONS. MANDATORY COMPLIANCE WITH EXISTING REGULATIONS AND PROGRAMS WOULD MINIMIZE THE RISK ASSOCIATED WITH THESE ACTIVITIES OR ACCIDENT CONDITIONS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Land use patterns and transportation projects associated with implementation of the 2022 RTP/SCS would temporarily increase the regional transport, use, storage, and disposal of hazardous materials commonly used at construction sites, such as diesel fuel, lubricants, paints and solvents, and asphalt and cement products containing strong basic or acidic chemicals. Hazardous waste generated during construction may consist of welding materials, fuel and lubricant containers, paint and solvent containers, and discarded asphalt and cement products.

Construction associated with implementation of the proposed 2022 RTP/SCS could result in impacts related to use of hazardous materials and disturbance of potentially hazardous materials, including asbestos. However, the most likely incidents involving construction-related hazardous materials are generally associated with minor spills or drips. Small fuel or oil spills are possible but would have a negligible impact on public health. All hazardous materials would be stored, handled, and disposed of according to the manufacturers' recommendations and spills would be cleaned up in accordance with applicable regulations, as described in Title 49 CFR 171–180 and the Hazardous Materials

Transportation Act. Hazardous materials spills or releases, including petroleum products such as gasoline, diesel, and hydraulic fluid, regardless of quantity spilled, must be immediately reported if the spill has entered or threatens to enter a water of the State, including a stream, lake, wetland, or storm drain, or has caused injury to a person or threatens injury to public health. Immediate notification must be made to the local emergency response agency, or 911, and the OES Warning Center. For non-petroleum products, additional reporting may be required if the release exceeds federal reportable quantity thresholds over a release period of 24 hours as detailed in HSC Section 25359.4 and in 40 CFR 302.4.As described above, the DOT has identified multiple routes within the SJCOG region as hazardous material routes (DOT 2021). According to the DTSC Hazardous Waste Tracking System database, approximately 56,000 tons of hazardous waste was transported within the SJCOG region in 2020. Additionally, trucks transporting hazardous material would also have to use local collector and arterial streets to access individual project sites in the SJCOG region. Transportation projects would also require the temporary storage and use of hazardous materials at locations along project roads. Thus, trucks transporting hazardous materials for project construction would use many of the same freeways, arterials, and local streets as other traffic. This would create a risk of accidents and associated release of hazardous materials affecting drivers and people along these routes, as well as drivers of those trucks. Although the transportation of hazardous materials could result in accidental spills, leaks, toxic releases, fire, or explosion, the DOT prescribes strict regulations for the safe transportation of hazardous materials, as described in Title 49 of the CFR and the Hazardous Materials Transportation Act. These standard accident and hazardous materials recovery training and procedures are enforced by the state and followed by private state-licensed, certified, and bonded transportation companies and contractors.

The construction of land use patterns and transportation projects included in the 2022 RTP/SCS that require demolition of existing structures, particularly older structures, would have the potential to expose workers and the public to asbestos containing materials or dust containing asbestos. HSC Section 19827.5 requires that local agencies not issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos. Mandatory compliance with asbestos abatement and disposal regulations and requirements would minimize the risk of exposure.

Land use patterns included in the 2022 RTP/SCS would have the potential to increase population, jobs, and households and a variety of land uses including residential, commercial, and industrial. Specific uses such as dry cleaners, gas stations, and certain industrial uses, would involve routine transport, use, and disposal of hazardous materials such as household hazardous wastes (e.g., paints, cleaning supplies, solvents, and petroleum products) and commercial and industrial hazardous waste. The operation of businesses facilitated by land use patterns included in the 2022 RTP/SCS that use, create, or dispose of hazardous materials would be regulated and monitored by federal, state, and local regulations that provide a high level of protection to the public and the environment from the hazardous materials manufactured within, transported to, and disposed within the SJCOG region. Use of hazardous materials at these businesses would also require permits and monitoring to avoid hazardous waste release through the local CUPA. During operation, businesses that store hazardous materials could potentially experience accidents or upset conditions that result from their routine use. These businesses would be required to prepare spill prevention, containment, and countermeasures plans (pursuant to 40 CFR 112) or, for smaller quantities, a spill prevention and response plan. These plans identify best management practices for spill and release prevention and provide procedures and responsibilities for rapidly, effectively, and safely cleaning up and disposing of any spills or releases. Oversight is provided by the CUPA.

Pursuant to the requirements and liabilities of applicable regulations, the routine use or accidental spill of hazardous materials at business and industrial uses facilitated by the land use patterns included in the 2022 RTP/SCS would not pose a substantial hazard to the public or the environment. Disposal of hazardous waste generated by these businesses would be subject to compliance with DTSC and CalEPA regulations.

Transportation projects included in the 2022 RTP/SCS include a variety of transportation modifications such as new travel lanes, auxiliary lanes, roadway widening, increased transit service and expansion, and other maintenance and rehabilitation projects. The projects may increase the capacity of roadways to transport hazardous materials. Roadway projects in the 2022 RTP/SCS would also improve road safety, as well as pedestrian and bicycle safety, thereby potentially reducing transportation-related hazardous materials risks because fewer accidents would occur on safer roads. Based on the requirements of Title 49 CFR 171–180, construction and operation of transportation projects would provide for the safe transport and disposal of hazardous waste.

The 2022 RTP/SCS encourages infill development and increased population and employment density near public transit stops, including rail. There could also be increased urbanization along transportation corridors. Thus, the number of people potentially exposed to hazardous conditions could increase as a result of land use patterns included in the 2022 RTP/SCS. To be declared a sustainable communities project under Public Resources Code Section 21155.1, projects in transit priority areas must demonstrate that there would not be an “unusually high” risk of fire or explosion from materials stored or used on or near the property and the project would not result in a risk of exposure to a potentially hazardous material at levels that exceed state and federal standards. This would occur on a project-specific basis and does not affect the other streamlining strategies and statutes under the Sustainable Communities Act.

As described above in the Regulatory Setting discussion, the DOT regulates the transport of hazardous materials by all modes, including rail and highway under the regulations of the Hazardous Materials Transportation Act. The Local Community Rail Security Act of 2006 requires all rail operators to provide security risk assessments to California Public Utilities Commission, which includes emergency response procedures and communication protocols. Mandatory implementation of additional federal, state, and local requirements such as CalARP Program and the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act would minimize potential exposure to the public and the environment from accidental releases. Therefore, although population density would increase in proximity to major transportation corridors that are used to transport hazardous and flammable materials, the increased risk of hazard from routine transport or accidental upsets during transport would be minimal.

In conclusion, both planned land use patterns and transportation projects could increase the routine transport, use, storage, and disposal of hazardous wastes in the SJCOG region. The planned land use patterns and transportation projects could also increase the potential for unintentional upset and accident conditions. Because of the existing federal, state, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with routine transport, use, storage and disposal activities, and regulations that effectively reduce the potential for individual projects to create a hazard to the public or the environment through reasonably foreseeable upset and accident conditions, impacts would be less than significant.

Mitigation Measures

No mitigation measures are required because this impact would be less than significant.

Threshold 3:	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school

Impact HAZ-2 TRANSPORTATION IMPROVEMENT PROJECTS AND LAND USE PATTERNS INCLUDED IN THE 2022 RTP/SCS WOULD FACILITATE HAZARDOUS EMISSIONS OR HANDLING OF ACUTELY HAZARDOUS MATERIALS, SUBSTANCES OR WASTE WITHIN ONE-QUARTER MILE OF AN EXISTING OR PROPOSED SCHOOL. EXISTING REGULATIONS AND PROGRAMS WOULD REDUCE THE RISK TO SCHOOLS. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

As described in Section 4.10.1.c*,* there are 246 public and private schools in the SJCOG region with more than 151,000 students enrolled (SJCOE 2021). Land use patterns included in the 2022 RTP/SCS would increase population, jobs, and households and a include a variety of land uses including residential, commercial, and industrial. Specific uses such as dry cleaners, gas stations, and certain industrial uses, would involve routine handling of hazardous materials such as household hazardous substances (e.g., paints, cleaning supplies, solvents, and petroleum products) and commercial and industrial hazardous waste. The 2022 RTP/SCS could increase the amount of hazardous materials handled within 0.25 mile of schools, depending on the specific location of land uses relative to schools in the region. Many of the proposed transportation projects and land use scenarios would occur in the main urban areas of the SJCOG region and as a result, may occur near schools.

Any new commercial or industrial operations in proximity to existing schools would be required to comply with regulations related to the routine use, storage, and transport of hazardous materials. Land uses that would generate emissions or involve the handling of extremely hazardous materials, substances, or waste within 0.25 mile of an existing school must notify the affected school district pursuant to Public Resources Code Section 21151.4. Compliance with existing regulations would reduce the exposure to potential hazards associated with these land uses.

For new schools that may be developed to address the population distribution changes resulting from land use patterns included in the 2022 RTP/SCS, the California Education Code, including Education Code Section 17213(b), establishes requirements for assessments and approvals that address the potential for existing contamination on the site, and whether nearby land uses might reasonably be anticipated to emit hazardous air emissions or handle hazardous materials. Assessment of existing contamination is conducted in coordination with DTSC's School Property Evaluation and Cleanup Division, which is responsible for assessing, investigating, and cleaning up proposed school sites. This Division ensures that selected properties are free of contamination or, if the properties were previously contaminated, that they have been cleaned up to a level that protects the students and staff who will occupy a new school. Therefore, hazardous emissions and handling impacts on schools related to land use patterns included in the 2022 RTP/SCS would be less than significant.

The transportation projects included in the 2022 RTP/SCS could increase the capacity to transport hazardous materials on roads within the SJCOG region, including within 0.25 mile of schools. However, all materials must be used, stored, and disposed of in accordance with applicable federal, state, and local laws, which would effectively reduce the potential impacts associated with hazardous emissions or handling of hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or potential future school. Transportation projects in the 2022 RTP/SCS may also improve road safety, thereby reducing the potential for accidents in proximity of schools related to hazardous materials. Therefore, the hazardous materials impacts related to existing and proposed schools from implementation of the transportation projects included in the 2022 RTP/SCS would be less than significant.

Mitigation Measures

No mitigation measures are required because this impact would be less than significant.

Threshold 4:	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

Impact HAZ-3 THE 2022 RTP/SCS INCLUDES LAND USE PATTERNS AND TRANSPORTATION PROJECTS THAT COULD OCCUR ON PREVIOUSLY UNKNOWN HAZARDOUS MATERIAL SITES OR SITES ON THE LIST COMPILED BY GOVERNMENT CODE SECTION 65962.5, AND THEREFORE CREATE A SIGNIFICANT HAZARD TO THE PUBLIC OR ENVIRONMENT. THIS IMPACT WOULD BE SIGNIFICANT BUT MITIGABLE.

Throughout the SJCOG region there are many sites where historical releases of hazardous materials or wastes have occurred; these are listed in environmental databases pursuant to Government Code Section 65962.5. As described above, there are hundreds of documented sites of contamination in some stage of DTSC or SWRCB oversight in the region. These sites range from small releases that have had localized effects on private property and have already been remediated to large scale releases from long-term historical industrial practices that have had wider ranging effects on groundwater. Specific sites of documented contamination are not evaluated in this analysis because this is a programmatic level document. Further, because the precise timing of future land use developments is unknown, an evaluation of the potential for specific sites of known contamination within the SJCOG region to be affected by land use patterns included in the 2022 RTP/SCS cannot be conducted at this time. However, land use can be used to generally characterize the potential for release of hazardous materials (i.e., hazardous materials releases are more likely to have occurred in areas that currently or historically supported industrial uses). In addition, construction activities that disturb subsurface materials could encounter previously unidentified contamination from past practices or placement of undocumented fill or even unauthorized disposal of hazardous wastes. Encountering these hazardous materials could expose workers, the public or the environment to adverse effects depending on the volume, materials involved, and concentrations.

A common practice that is typically required by lending institutions when properties change hands is for a Phase I ESA to be prepared to research and disclose the prior uses of the site and the likelihood that residual hazardous materials and/or waste might be present in underlying soil and/or groundwater. Also, in many instances implementing and/or permitting agencies require submittal of a Phase I ESA prior to approval or implementation of a project. These studies include research in a variety of government databases to determine whether the site has had prior underground tanks or other industrial uses that could result in hazardous materials on or below the ground surface. However, with the exceptions for streamlining projects in transit priority areas and siting public schools, there are no general regulatory requirements to conduct a Phase I ESA, or subsequent investigation of potential contamination. Therefore, because it cannot be assumed these practices would regularly occur, the impacts related to in land use patterns included in the 2022 RTP/SCS would be potentially significant.

Similarly, there would be potential for transportation projects to encounter previously unidentified contamination from past practices on sites that have not been listed in environmental databases pursuant to Government Code Section 65962.5. Thus, the impacts of transportation projects included in the 2022 RTP/SCS would be significant.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measure developed for the 2022 RTP/SCS program where applicable for transportation projects that would be located on or near hazardous materials. Municipalities in the SJCOG region can and should implement this measure, where relevant to land use projects implementing the 2022 RTP/SCS.

HAZ-3 Site Remediation

If an individual project included in the 2022 RTP/SCS is located on or near hazardous materials and/or waste site pursuant to Government Code Section 65962.5, or has the potential for residual hazardous materials and/or waste as a result of location and/or prior uses, the project sponsor shall prepare a Phase I ESA in accordance with the American Society for Testing and Materials' E-1527-05 standard. For work requiring any demolition or renovation, the Phase I ESA shall make recommendations for any hazardous building materials survey work that shall be done. All recommendations included in a Phase I ESA prepared for a site shall be implemented. If a Phase I ESA indicates the presence or likely presence of contamination, the implementing agency shall require a Phase II ESA, and recommendations of the Phase II ESA shall be fully implemented. Examples of typical recommendations provided in Phase I/II ESAs include removal of contaminated soil in accordance with a soil management plan approved by the local environmental health department; covering stockpiles of contaminated soil to prevent fugitive dust emissions; capturing groundwater encountered during construction in a holding tank for additional testing and characterization and disposal based on its characterization; and development of a health and safety plan for construction workers.

For any project located on or near sites that are not listed and do not have the potential for residual hazardous materials as a result of historic land uses, no action is required unless unknown hazards are discovered during development. In that case, the implementing agency shall discontinue development until DTSC, RWQCB, SJVAPCD, and/or other responsible agency issues a determination, which would likely require a Phase I ESA as part of the assessment.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction, as applicable.

Significance After Mitigation

With implementation of Mitigation Measure HAZ-3, this impact would be reduced to below thresholds of significance because project sites with hazardous material contamination that are previously unknown and not included on the list compiled by the Government Code Section 65962.5 would be identified prior to commencement of project construction. Additionally, prior to commencement of construction, measures to remediate contamination, such as containment and disposal of contaminated soil pursuant to federal and state regulations would be required. These measures would prevent construction workers or other people from substantial exposure to hazardous materials.

Threshold 5:	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, result in a safety hazard or excessive noise for people residing or working in the project area

Impact HAZ-4 TRANSPORTATION IMPROVEMENT PROJECTS AND LAND USE SCENARIO ENVISIONED BY THE 2022 RTP/SCS MAY BE LOCATED AT OR NEAR A PUBLIC USE AIRPORT OR PRIVATE AIRSTRIP. EXISTING REGULATIONS AND REGULATORY OVERSIGHT WOULD REDUCE THE INHERENT HAZARD OF DEVELOPMENT NEAR AIRPORTS TO SAFE LEVELS, AND THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

Land use patterns and transportation projects included in the 2022 RTP/SCS may be located at or near one of the six public use airports or the private airstrips in the SJCOG region, and/or within the ALUCP areas. Impacts associated with development at or near existing airports are largely dependent upon site- and project-specific information that is not currently available and would be provided in the future as projects within the 2022 RTP/SCS undergo project level environmental review. However, any development and subsequent planning decisions in proximity to airports would be subject to review under the State Aeronautics Act provided under Public Utilities Code § 21167 et seq. Specific projects that may affect navigable airspace are also subject to FAA review, as outlined under 14 CFR Parts 77.5, 77.7, and 77.9. Additionally, the 2022 RTP/SCS would not change existing land use designations or zoning, and land use development would be subject to existing zoning regulations, including height restrictions. Because there are existing federal, state, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with development near airports to an acceptable and safe level, the 2022 RTP/SCS would result in a less than significant impact.

Mitigation Measures

No mitigation measures are required because this impact would be less than significant.

Threshold 6:	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan

Impact HAZ-5 TRANSPORTATION IMPROVEMENT PROJECTS AND THE LAND USE SCENARIO ENVISIONED BY THE 2022 RTP/SCS COULD INTERFERE WITH EXISTING EMERGENCY RESPONSE AND EVACUATION. HOWEVER, REQUIRED REGULAR UPDATES TO EMERGENCY RESPONSE AND EVACUATION PLANS WOULD ACCOUNT FOR DEVELOPMENT AND PROJECTS AND STANDARD NOTIFICATION OF EMERGENCY RESPONSE AGENCIES DURING CONSTRUCTION ACTIVITIES WOULD ENSURE EVACUATION AND RESPONSE ROUTES ARE MODIFIED APPROPRIATELY. IMPACTS RELATED TO INTERFERENCE OR IMPAIRMENT OF AN ADOPTED EMERGENCY RESPONSE PLAN OR EMERGENCY EVACUATION PLAN WOULD BE LESS THAN SIGNIFICANT.

Construction of the land use scenario and transportation projects included in the 2022 RTP/SCS would require temporary road closures that could impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. Some of the transportation projects may require multiple years to construct. However, standard construction practices include notification of emergency responders where road closures are required. Because road closures are temporary and would be coordinated with emergency responders so that alternative evaluation routes could be developed and employed, construction activities would have a less than significant impact.

The land use patterns included the 2022 RTP/SCS emphasize infill and transit-oriented development, which would generally focus growth in existing urbanized areas of the SJCOG region. Thus,

population density in urbanized areas would increase, which may improve emergency response by eliminating the need to travel to more rural and dispersed locations in the region. Alternatively, large concentrations of people could also cause adverse effects related to the implementation emergency plans because the increased population may overburden adopted evacuation routes and other emergency response resources. However, the management of emergency response and emergency evacuation plans includes regular updates to these plans that incorporate new or proposed developments. Thus, land use patterns in the 2022 RTP/SCS would be reflected in the regular updates of emergency and evacuation plans applicable to the SJCOG region.

Additionally, the proposed transportation projects would generally increase mobility and circulation capacity and, thereby, have the potential to improve response times for police, fire, and emergency service providers, especially in heavily congested areas. However, as described above, emergency and evacuation plans are regularly updated to incorporate current conditions. Therefore, potential impacts related to interference with emergency response and evacuation plans would be less than significant.

Mitigation Measures

No mitigation measures are required because this impact would be less than significant.

c. Specific 2022 RTP/SCS Projects That May Result in Impacts

The analysis within this section discusses the potential hazards and hazardous materials related impacts associated with the transportation improvement projects and the land use scenario included in the 2022 RTP/SCS. The projects within the 2022 RTP/SCS are evaluated herein in their entirety, and all would be subject to existing federal, state, and local regulations and programs that regulate and manage hazards and hazardous materials. As described above, the 2022 RTP/SCS includes land use development patterns and transportation projects that could increase the transport, use, storage, and disposal of hazardous materials and waste within the SJCOG region. A comprehensive list of specific projects that could increase the transport, use, storage, and disposal of hazardous materials and waste within the SJCOG region cannot be provided in this section because the specific location of land use development projects is undetermined. However, the transportation projects would involve increasing the capacity on roads that the U.S. DOT has identified as hazardous material routes. Increasing the capacity of these roads could increase the amount of hazardous material and waste transported on the roads. Furthermore, construction of any number of the land use development and transportation projects would presumably require the use of petroleum products and similar construction-related hazardous materials, at a minimum.

As described above, the land use development and transportation projects could also be located on hazardous material sites, including sites on the list compiled by Government Code Section 65962.5 (i.e., Cortese list). However, there are no specific projects that can be listed in this section because the specific timing of land use development projects is undetermined.

4.10.4 Cumulative Impacts

The cumulative impact analysis area for hazards and hazardous materials consists of the SJCOG region and adjoining counties. Information regarding these adjoining counties can be found in Section 3.1 – Environmental Setting, Table 3-1. Future development in this region that could result in impacts related to hazards and hazardous materials is considered in the analysis. This cumulative extent is used to evaluate potential direct and indirect, and permanent and temporary impacts to

the public or the environment associated with hazardous materials, hazardous emissions, or other safety hazards within the context of the SJCOG region and adjoining counties.

The potential impacts related to hazards and hazardous materials are generally related to site specific and project specific characteristics and conditions; however, hazardous sites or releases can occur across multiple adjoining properties or jurisdictions. Although the transport of hazardous materials may occur on rail or on roadways, such as Interstate 5, that traverse both the SJCOG region and adjacent counties, there are existing federal, state, and local regulations and oversight in place that would effectively reduce the inherent hazard associated with routine transport of such materials. Regulations and oversight, as outlined above in Section 4.10.2, *Regulatory Setting*, would also effectively reduce the potential for individual projects to create a hazard to the public or the environment through reasonably foreseeable upset and accident conditions, within the SJCOG region as well as adjoining counties. Land use development envisioned as part of the proposed 2022 RTP/SCS could result in the development of sites listed in environmental databases pursuant to Government Code Section 65962.5. Although development of listed sites would be required to undergo remediation and comply with Mitigation Measure HAZ-3, cumulative impacts related to hazards and hazardous materials would be significant, and implementation of the proposed 2022 RTP/SCS would result in cumulatively considerable impacts pre-mitigation, and less-than-cumulatively considerable post-mitigation.

Impacts related to airport hazards are also site-specific, depending on the characteristics and design of individual projects and their location relative to distance and location of nearby airports. Existing regulations place limitations on the types of development that can be permitted within various aircraft zones surrounding an airport, such as building height restrictions or prohibiting residential occupancy. Mandatory compliance with these regulations would prevent substantial hazards related to exposure to airport related safety hazards. Cumulative impacts related to airport hazards would be less than significant and implementation of the proposed 2022 RTP/SCS would not result in cumulatively considerable impacts.

4.11 Hydrology and Water Quality

This section describes the environmental and regulatory setting as well as potential water quality, groundwater supply, drainage, runoff, flooding, and dam inundation impacts of development facilitated by the proposed 2022 RTP/SCS.

4.11.1 Setting

The SJCOG region encompasses approximately 1,440 square miles in central California, and includes rivers, streams, sloughs, marshes, wetlands, channels, harbors, and aquifers. Stockton is the largest city in the SJCOG region.

a. Surface Water Hydrology

The SJCOG region is contained entirely within the San Joaquin River Hydrologic Region (HR), which includes all or part of 15 counties, four groundwater basins, and eleven subbasins. The HR stretches from the Sierra Nevadas in the east to the Coastal Range in the west. The northern border of the HR roughly follows the Cosumnes River to Folsom Lake and then lies between the Cosumnes and South Fork American Rivers. Fresno County marks the southern extent of the HR (DWR 2021). The San Joaquin Valley is a broad alluvial plain which comprises the southernmost portion of the Great Valley Geomorphic Province of California. The Great Valley is a broad structural trough bounded by the tilted block of the Sierra Nevada on the east, the uplifted Klamath Mountains to the north, and the complexly folded and faulted Coast Ranges on the west (California Geological Survey 2002).

The major rivers in the San Joaquin River HR are the San Joaquin, Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno. In general, watersheds within the HR flow from the foothills of the Sierra Nevadas towards the Sacramento-San Joaquin River Delta (the 'Delta') and eventually discharge into San Francisco Bay. The Calaveras, Mokelumne, and Stanislaus Rivers flow through or border the SJCOG region and discharge directly into the Delta or into the San Joaquin River which in turn flows through the SJCOG region and to the Delta. The west and southwestern portion of the SJCOG region are part of the Delta (Eastern San Joaquin Groundwater Basin Authority [ESJGBA] 2014).

San Joaquin River

The San Joaquin River is approximately 330 miles long and originates on the western slopes of the Sierra Nevada Mountains. It drains an area of approximately 13,500 square miles including most of the area from the southern border of Yosemite, south to Kings Canyon National Park. The majority of its flow derives from the Merced, Tuolumne, and Stanislaus Rivers. It flows northwest through the SJCOG region before entering the Delta (ESJGBA 2014).

Mokelumne River

The Mokelumne River flows westward from its headwaters high in the Sierra Nevada to the eastern edge of the Delta where it combines with the Cosumnes River. It drains approximately 660 square miles with several reservoirs including the Pardee and Camanche Reservoirs which provide water supply to the East Bay Municipal Utility District (EBMUD) and the PG&E-operated Salt Springs Reservoir which is used for hydropower generation and is not in the SJCOG region (ESJGBA 2014).

Calaveras River

The Calaveras River flows southwest for approximately 80 miles and originates in northeast Calaveras County. The Calaveras River drains approximately 363 square miles and flows through San Joaquin County and the City of Stockton before flowing into the San Joaquin River. It derives almost entirely from rainfall, with virtually no snowmelt inflow, and contains the New Hogan Dam and Reservoir, operated by the United States Army Corps of Engineers (ESJGBA 2014).

Stanislaus River

The Stanislaus River is approximately 65 miles long and is extensively dammed, including the New Melones Dam which is an integral part of the Central Valley Project (CVP) water distribution system. It drains an approximately 904-square- mile watershed and is one of the largest tributaries to the San Joaquin River with an average annual runoff of one million acre-feet per year (AFY). It has a North, Middle, and South Fork and originates in the Sierra Nevada. The Stanislaus River forms the southern boundary of the SJCOG region, just north of Modesto (ESJGBA 2014).

Other Rivers

The Tuolumne River originates in the Sierra Nevada Mountains and is the largest tributary to the San Joaquin River. It has a watershed of approximately 1,500 square miles and an unimpaired annual runoff of approximately 1.8 million acre-feet. Flows in the lower reaches of the Tuolumne River are regulated by the New Don Pedro Dam, which was constructed in 1971 and is owned by Turlock and Modesto Irrigation Districts. New Don Pedro Reservoir has a capacity of approximately 2 million acre-feet and is operated for irrigation, hydroelectric generation, fish/wildlife protection, recreation, and flood control. Irrigation water is diverted downstream from New Don Pedro at La Grange into the Modesto Main Canal and Turlock Main Canal. The City and County of San Francisco operate O'Shaughnessy Dam in the Hetch Hetchy Valley, Lake Eleanor, and Cherry Lake in the upper watershed of the Tuolumne. These facilities are operated for municipal and industrial supply as well as hydropower (ESJGBA 2014).

The Cosumnes River is a tributary to the Mokelumne River, with the confluence of these two rivers located just north of the San Joaquin-Sacramento County line, near the town of Thornton.

Dry Creek is a minor tributary to the Mokelumne River and forms the northern boundary between San Joaquin and Sacramento Counties.

Reservoirs

The SJCOG region has eight reservoirs, one being the Camanche Reservoir which is located at the juncture of Amador, Calaveras, and San Joaquin counties. Table 4.11-1 lists each reservoir and provides the water source, size, and operating agency of each reservoir.

Table 4.11-1 Reservoirs in the SJCOG Region

Reservoir	River	Size (acre/feet)	Owning/Operating Agency
Pardee Reservoir	Mokelumne River	197,950	East Bay Municipal Utility District
Camanche	Mokelumne River	417,120	East Bay Municipal Utility District
New Hogan Lake	Calaveras River	317,000	US Bureau of Reclamation, US Army Corps. of Engineers, Stockton East Water District, Calaveras County Water District

Reservoir	River	Size (acre/feet)	Owning/Operating Agency
New Melones Reservoir	Stanislaus River	2,400,00	US Bureau of Reclamation, Central Valley Water Project
Beardsley Reservoir	Stanislaus River	77,600	Oakdale Irrigation District and South San Joaquin Irrigation District
Donnells Reservoir	Stanislaus River	56,893	Oakdale Irrigation District and South San Joaquin Irrigation District
Tulloch Reservoir	Stanislaus River	68,400	Oakdale Irrigation District and South San Joaquin Irrigation District
Friant Dam	San Joaquin River	520,500	US Bureau of Reclamation

Source: State of California, California Statistical Abstract, 2002 presented in the 2014 Eastern San Joaquin GBA IRWMP.

b. The Delta Hydrology

The Delta waterway system is one of the States most valuable water resources. The Delta lies within the boundaries of six counties (San Joaquin, Sacramento, Yolo, Contra Costa, Alameda, and Solano Counties) but over half of it—approximately 55%--lies within western San Joaquin County. The Delta is legally divided into the Primary Delta and Secondary Delta with differing regulations and uses. In 2016, about one-quarter of California's drinking water came from the Delta, and about two-thirds of Californians got some or all of their drinking water from the Delta. Over 7.0 million acres of agricultural land, including some of the most productive and valuable agricultural areas in the world, are irrigated using Delta water imported through the State Water Project (SWP) and federal Central Valley Project (CVP). Over 700,000 acres of land and 700 miles of interlacing waterways form the Delta. Many aspects of the Delta are managed by the Delta Protection Commission and the Delta Stewardship Council (DSC), while the water itself is managed by the Delta Watermaster (San Joaquin County 2016).

All the rivers within the SJCOG region either flow directly into the Delta or flow into the San Joaquin which in turn runs into the Delta. The hydrology of the Delta has been impacted by the vast network of canals, waterways, and levees designed to control and channel the waters to provide for transportation, flood control, and water direction into the crucial SWP and CVP aqueduct systems. The portion of the Delta within the SJCOG region consists of extensive wetlands and ecologically critical areas north of State Highway 12 fed by the Mokelumne River, the many islands and both natural and artificial waterways surrounding and formed by the San Joaquin River west of Stockton, and the wetlands of the Old and Middle Rivers northwest of Tracy. Bethel Island and Discovery Bay both lie just outside the SJCOG region to the west.

c. Groundwater Hydrogeology

Three groundwater subbasins fall within the SJCOG region, including the Eastern San Joaquin and Tracy Subbasins and the northwestern tip of the Delta-Mendota Subbasin. The information in this section is largely taken from the DWR's Bulletin 118 (California's Groundwater) entries for the respective subbasins (DWR 2006 a-c) and from the Groundwater Sustainability Plans (GSPs) for the two main Subbasins (see *Water Management Agencies,* below). The Cosumnes Subbasin was previously considered to lie within both San Joaquin and Sacramento Counties in the 2006 updates to Bulletin 118 but has since been redrawn so the border of the Cosumnes Subbasin and the Eastern San Joaquin Subbasin matches the border between the two Counties. This analysis focuses on the first two Subbasins; the Delta-Mendota Subbasin is not a primary source of groundwater within the

SJCOG region, and the area of the Subbasin overlain by the SJCOG region is comparatively small. The Delta-Mendota Subbasin is managed by the Del Puerto Water District of Stanislaus County.

Eastern San Joaquin Subbasin

The Eastern San Joaquin Subbasin is defined by DWR as the areal extent of unconsolidated and semi-consolidated sedimentary deposits and is bounded by the Mokelumne, San Joaquin, and Stanislaus Rivers as well as consolidated bedrock to the east and lies entirely within the SJCOG region. Inflow estimates indicate the primary sources of recharge are precipitation and applied water, with some seepage from surface waters. Measurements over the 40 years prior to 2006 show a fairly continuous decline in groundwater levels in eastern San Joaquin County. Groundwater levels declined at an average rate of 1.7 feet per year and dropped as much as 100 feet in some areas. It is estimated that groundwater overdraft during that period reduced storage in the basin by as much as 2 million acre feet (af). Due to the continued overdraft of groundwater within the subbasin extending to the present day, significant groundwater depressions are present below the City of Stockton, east of Stockton, and east of Lodi. Several of these groundwater depressions extend to depths of about 100 feet below ground surface (or more than 40 feet below mean sea level, DWR 2006a). This has resulted in alteration of the hydrology of the subbasin, as some groundwater now flows towards the lower depression instead of away from it towards the Delta, and greatly exacerbated existing issues to water quality from salinity, which are discussed under *Water Quality*, below.

The total available groundwater storage capacity from a depth of 20 feet to the base of the groundwater basin was estimated at about 42,400,000 af based on a total aquifer material volume of 579,900,000 af and an average specific yield of 7.3 percent. This estimate was based on a study area that encompassed approximately 586,000 acres. Since the currently defined subbasin size is over 707,000 acres, the storage value mentioned above underestimates the total storage capacity for the subbasin area as defined in Bulletin 118 (DWR 2006a). In 2015, studies estimated the current available groundwater actually in storage at approximately 50,000,000 AF, and an overdraft rate of 0.01 percent per year from 1995 to 2015 (ESJGA 2019).

The areas of the Subbasin closest to the Delta see the least pumping and levels there have been fairly stable for decades (ESJGA 2019).

Tracy Subbasin

The Tracy Subbasin also lies entirely within the SJCOG region. It is bounded by the Diablo Range to the west, the Mokelumne and San Joaquin Rivers to the north and east, and the San Joaquin County line with Stanislaus County to the south. It is adjacent to the Eastern San Joaquin Subbasin. Roughly half of the Tracy Subbasin consists of Delta islands and waterways and the rest is mixed urban and agricultural communities. 97 percent of the water used in the subbasin is surface water. There is insufficient published data to provide a groundwater budget or estimate of recharge sources (DWR 2006b). Review of hydrographs for the Tracy Subbasin indicate that, except for seasonal variation resulting from recharge and pumping, the majority of water levels in wells remained relatively stable over the period from 1996 to 2006. There are no published groundwater storage values for the entire basin; however, the groundwater storage capacity for the Tracy-Patterson Storage Unit is estimated at 4,040,000 af. This storage unit includes the southern portion of the currently defined Tracy Subbasin from approximately one-mile north of Tracy to the San Joaquin-Stanislaus County line. Since the Tracy Subbasin comprises roughly one third of the Tracy-Patterson Storage Unit, it

can be inferred that the approximate storage capacity of the southern portion of the Tracy Subbasin is on the order of 1,300,00 af (DWR 2006b).

d. Water Quality

Water quality is a concern because of its potential effect on human health, aquatic organisms, and ecosystem conditions. Quality is determined by factors such as native condition of groundwater and surface water, and sources of contamination (natural and human induced).

Urban areas of the SJCOG region are largely characterized by impervious surfaces, such as buildings, roads, sidewalks, and parking lots. These features alter the natural hydrology of their area by preventing infiltration, increasing and redirecting runoff, and ultimately increasing the risk of pollutant discharge and flooding. Agricultural land uses can cover large areas with contaminants such as fertilizer and pesticides which can infiltrate into soil or runoff into drainage channels that feed to the streams.

Surface Water

Surface water quality within the SJCOG region is monitored and regulated by the Central Valley Regional Water Quality Control Board (CVRWQCB), which, under the authority of Section 303 of the Clean Water Act (see Section 4.11.2, *Regulatory Setting)* determines the beneficial uses that each water body has and has listed multiple water bodies as impaired from these uses due to one or more pollutants. The CVRWQCB Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (the 'Basin Plan') describes water quality objectives within the SJCOG region and neighboring areas (CVRWQCB 2018). Table 4.11-2 lists all 303(d) listed waterbodies within the SJCOG region. Contamination of these waterbodies is largely due to urban and agriculture runoff, as well as resource extraction. The CVRWQCB describes the Delta within the SJCOG region and all the major rivers as impaired primarily from urban and agricultural runoff, including polluted stormwater flows and septic and landfill leachate in the urban areas as well as fertilizer and pesticide runoff and uncontrolled animal waste management from the large agricultural land use. Upstream, many of the tributaries and streams that flow into the larger rivers are contaminated, especially with heavy metals from mining in the foothill and mountain areas that are the source of many of the streams. Timber harvesting is another primary source of contamination. CVRWQCB considers mining to be the largest source of copper, zinc, and cadmium to area surface waters, far exceeding natural levels (CVRWQCB 2018).

Table 4.11-2 303(d) Impaired Water Bodies in the SJCOG Region

Water Body Name	Water Body Type	Pollutant
Avena Drain	River and Stream	Ammonia, IB
Bear Creek (eastern portion)	River and Stream	Copper, Diazinon, IB, DO
Brack Tract Drain	River and Stream	Arsenic
Calaveras River, Lower	River and Stream	Toxicity, Mercury, IB, OE, Chlorpyrifos, Diazinon
Camanche Reservoir	Lake and Reservoir	Zinc, Mercury, Copper
Davis No 2 (unnamed spillway)	Lake and Reservoir	Mercury
Delta Waterways (central portion)	Estuary	Chlorpyrifos, DDT, Diazinon, Group A Pesticides, IS, Mercury, Toxicity
Delta Waterways (eastern portion)	Estuary	Chlorpyrifos, DDT, Diazinon, Group A Pesticides, IS, Mercury, Toxicity

Water Body Name	Water Body Type	Pollutant
Delta Waterways (export area)	Estuary	Chlorpyrifos, DDT, Diazinon, EC, Group A Pesticides, IS, Mercury, Toxicity
Delta Waterways (southern portion)	Estuary	Chlorpyrifos, DDT, Diazinon, EC, Group A Pesticides, IS, Mercury, Toxicity
Delta Waterways (Stockton Ship Channel)	Estuary	Chlorpyrifos, DDT, Diazinon, Furan Compounds, Group A Pesticides, IS, Mercury, OE, DO, PCBs, Temperature, Toxicity
Duck Creek (San Joaquin County)	River and Stream	Chlorpyrifos, IB, Toxicity, Mercury
Five Mile Slough (in Delta Waterways, eastern portion)	River and Stream	Chlorpyrifos, Diazinon, OE, DO
French Camp Slough (San Joaquin County)	River and Stream	Chlorpyrifos, Diazinon, IB, DO, Sediment, Toxicity
Grant Line Canal	River and Stream	EC, Salinity
Hospital Creek	River and Stream	DDE, DDT, Dieldrin, Dimethoate, IB, Pyrethroids, Salinity, Sediment, Toxicity Trifluralin, Arsenic, EC, Chlorpyrifos
Little Johns Creek	River and Stream	IB, Toxicity, Chlorpyrifos
Middle River	River and Stream	DO
Mokelumne River, Lower	River and Stream	Chlorpyrifos, Copper, Mercury, DO, Toxicity, Zinc
Mormon Slough (eastern portion)	River and Stream	OE, IB, DO
Mormon Slough (Calaveras River)	River and Stream	OE, DO, IB, Chlorpyrifos, Toxicity
Mosher Slough	River and Stream	OE, Mercury, IB, Chlorpyrifos, Diazinon
Mountain House Creek	River and Stream	Chloride, Salinity
Old River	River and Stream	EC, Sediment, Chlorpyrifos
Pixley Slough	River and Stream	Chlorpyrifos, Diazinon, E. coli, DO, IB, Toxicity
San Joaquin River (Tuolumne River to Stanislaus River)	River and Stream	Chlorpyrifos, DDT, Diazinon, EC, Group A Pesticides, Mercury, Temperature, Toxicity
San Joaquin River (Stanislaus River to Delta Boundary)	River and Stream	Chlorpyrifos, DDE, DDT , Diuron, EC, IB, Group A Pesticides Mercury, Temperature, Toxaphene, Toxicity
Smith Canal	River and Stream	OE, DO, IB, Organophosphate Pesticides
Temple Creek	River and Stream	Ammonia, IB
Tom Paine Slough	River and Stream	Chloride, DO, IB,Salinity
Walker Slough	River and Stream	IB

DO: Dissolved Oxygen; IB: Indicator Bacteria (*E. Coli*); EC: Electrical Conductivity; OE: Organic Enrichment (nutrients); IS: Invasive Species.
Source: SWRCB 2018 303(d) List

Groundwater

Localized impairments including total dissolved solids (TDS), sodium chloride, nitrate, and inorganic compounds—especially arsenic-- are common in groundwater in the SJCOG region, impairing the water quality. In many cases, sampling has indicated levels of salinity, nitrates, arsenic, and other contaminants well in excess of the Maximum Contaminant Levels (MCLs, see Section 4.11.2, *Regulatory Setting*) established for drinking water by the USEPA. However, groundwater is generally treated prior to use as drinking water, and currently all the groundwater within the SJCOG region is not considered impaired for the beneficial uses of drinking or agricultural supply (CVRWQCB 2018).

The primary constituents of concern in groundwater within the SJCOG region - and within the entire San Joaquin River Basin - are naturally occurring salinity and arsenic in addition to anthropogenic nitrates, salinity, and point-source contaminants from urban and industrial use (CVRWQCB 2018). The greatest concern is salinity, which derives from both natural and anthropogenic sources and is of concern throughout the entire HR and especially the San Joaquin River Basin.

Natural salinity increases as groundwater is depleted. The flow of dissolved solids and salts from natural sources is relatively constant into the subbasins from the Sierra Nevada foothills and from there into Delta sediments and groundwater. As the amount of groundwater is reduced, the concentration of salt ions increases accordingly. In addition, there is a deep saline aquifer underlying the freshwater aquifers of the San Joaquin Valley which originates in marine sedimentary deposited rocks which underlie the alluvial plain of the Great Valley. As it is denser it does not normally migrate upwards into the freshwater above, but both deep wells and pumping from shallower wells can cause upwelling of the deep saline waters into the shallower, lighter freshwater aquifers. A further source of salinity is agricultural runoff, which causes salinity flow both from pesticide and fertilizer runoff but also increases salinity as applied irrigation water evaporates and leaves higher concentrations of salts behind to be washed off in rain or runoff. CVRWQCB and the local Groundwater Sustainability Agencies (GSAs) have expressed great concern over the rate of increase in salinity and some estimates indicate that if left unchecked, increasing salinity could eventually render the majority of the groundwater in the entire basin unusable (CVRWQCB 2018, ESJGA 2019).

Nitrates occur both naturally and anthropogenically in groundwater but human sources, primarily from agricultural practices, are by far the greatest source. Levels have been increasing steadily even as more sampling wells have been drilled; in 1960 1% of the 240 wells sampled had nitrate concentrations above the MCL, and in 2010 17% of the 11,060 wells sampled had concentrations over the MCL (ESJGA 2019). The Groundwater Sustainability Plans (GSPs) submitted and under review for the SJCOG region contain proposed methods to reduce nitrate contamination, but also state there is no direct evidence for a causal nexus between nitrate contamination to groundwater management and cite a lack of regulatory authority over land use problems.

Arsenic is common in natural groundwaters, particularly in California, and arises both from natural sources and agricultural or industrial practices. Federal and State standards for arsenic were revised in 2006, and the number of wells with concentrations of arsenic over MCL limits has been rising steadily since data began being collected in the 1960s; it is primarily detected in the areas between Interstate 5 and State Route 99 and not as regularly in the streams flowing from the foothills, indicating a strong probability that arsenic contamination in area groundwaters may be derived more from anthropogenic agricultural sources than from mountain runoff or existing arsenic-laden subterranean strata. In 1970, 14 percent of 339 wells sampled were over the 2006 MCL, and by 2010 52% of 5,109 wells had concentrations over the MCL (ESJGA 2019).

A brief specific water quality description for each of the SJCOG region's subbasins is provided below.

Eastern San Joaquin Subbasin

As a result of declining groundwater levels, water with higher salinity has been moving east along the east side of the Delta. The degradation is particularly evident in the Stockton area where the saline front was moving eastward at a rate of 140 to 150 feet per year in a DWR study conducted in 1967. Data from 1980 and 1996 indicated that the saline front had continued to migrate eastward up to about one mile beyond its 1963 extent. This may be partially caused—and worsened—by the increasing groundwater depression east of Stockton which creates a height gradient and causes more-saline groundwater close to the Delta to flow towards it instead of away. Large areas of

elevated nitrate in groundwater also exist within the subbasin, located southeast of Lodi and south of Stockton and east of Manteca extending towards the San Joaquin – Stanislaus County line (DWR 2006a).

Tracy Subbasin

Areas of poor water quality exist throughout the subbasin. Areas of elevated chloride occur in several areas including along the western side of the subbasin, in the vicinity of the City of Tracy, and along the San Joaquin River. Areas of elevated nitrate occur in the northwestern part of the subbasin and in the vicinity of the City of Tracy. Areas of elevated boron occur over a large portion of the subbasin from south of Tracy and extending to the northwest side of the subbasin (DWR 2006b).

e. Water Supply

Water delivery in the SJCOG region is provided by dozens of agencies and projects including federal, state, regional, and local water projects and special districts (e.g., irrigation, water, and water conservation). Private water systems also account for a large percentage of the estimated water usage in the SJCOG region, including for agricultural irrigation, and many of these systems and wells are unmetered and do not report their usage to any agency. Irrigation and domestic water systems within the SJCOG region are operated and maintained by irrigation districts, water districts, and water conservation districts. The many large reservoirs within the SJCOG region which serve both the SJCOG region and other parts of the State are likewise operated by a variety of local, state, and federal agencies including USBR and USACE.

The Delta is a major source of water for the entire State through the systems of aqueducts and canals of the SWP and the CVP; the C.W. Bill Jones Pumping Plant north of the City of Tracy is a major transit point for water from the Sacramento River into the Delta-Mendota Canal and the CVP. The main water resources in the SJCOG region are provided in Table 4.11-3, presenting the primary users of these resources, and the beneficial uses associated with each source.

Table 4.11-3 Water Sources and Uses in the SJCOG Region

Water Source	IRR	MUN/IND	REC	TRANS	WLF	Primary Users
San Joaquin River	X		X	X	X	Riparian, Farmers, Shipping Industry, Irrigation
Mokelumne River	X		X		X	Irrigation
Camanche Reservoir	X		X			Local Residents
Calaveras River	X	X			X	Water Districts
Stanislaus River	X		X		X	Irrigation Districts
Delta	X		X	X	X	Recreation, Wildlife, Shipping Industry, DWR, USBR
Delta-Mendota Canal	X	X	X		X	City of Tracy, Irrigation Districts, Commercial Businesses
California Aqueduct	X	X	X		X	Commercial Businesses, Irrigation Districts
Lodi Lake			X			Local Residents
Groundwater	X	X				Private Individuals, Cities, Towns

Notes: DWR= California Department of Water Resources, USBR= US Bureau of Reclamation
Beneficial Uses: IRR=Irrigation, MUN/IND=Municipal/Industrial, REC=Recreation, TRANS=Transportation, WLF=Estuary/Wildlife Area.
Source: 2009 San Joaquin County General Plan Update, Natural Resources Element

Surface Water

Surface water supplies in the SJCOG region are subject to the complex system of riparian and appropriative rights and are further complicated by numerous agreements and water service contracts. The quantity of imported surface water delivered each year for groundwater recharge and urban or agricultural use varies significantly from year to year due to contractual and water rights conditions. The actual quantities utilized within the SJCOG region also vary significantly with climatic fluctuations, infrastructure limitations, and facility operation. In general, the SJCOG region uses both native surface waters and groundwater and imports surface water from the CVP and SWP through the Delta.

Surface water supplies are likely to decrease in the future. Several current contracts are for "interim" supplies, which are available subject to requirements of upstream or senior rights holders. Contracts on much of the Counties' surface water imports expired in 2015 and the 'interim' status reflects ongoing negotiations regarding future contracts for surface water imports. As development increases in areas with senior water rights, County surface water supplies will be correspondingly reduced. Water from the Delta through the CVP or SWP that isn't distributed locally by the three Delta Water Agencies is controlled by the Delta Watermaster, and allocations of water from the Delta are subject to reductions in contracted amounts ('Table A' amounts for the SWP) during drought years as the SWP and CVP systems must distribute water to a large number of contract-holding purveyors throughout the State; it is exceptionally rare that any contractor will receive their full legal maximum allocation of water from the SWP or CVP.

San Joaquin County has been attempting to obtain diversionary water rights to water from the American River from DWR since 1990. The most recent application denial and resubmittal was in 2010. If municipalities in the SJCOG region obtain rights to water from the American, they would only be from December 30 to June 1 of any year, and only if allocations were available. It is unlikely the American River will be a significant source of surface water to the SJCOG region even if the application is adopted by DWR.

Groundwater and Groundwater Banking

Beginning in 1850 the development of groundwater for agriculture expanded rapidly. Within the Central Valley irrigated agriculture has grown from less than 1 million acres to an estimated 7 to 8 million acres at present over the last 100 hundred years, although in periods of drought the amount of land actually irrigated can be up to 1.9 million acres less (NASA 2015). In average years almost 870,000 af is pumped per year within the SJCOG region from the Eastern San Joaquin Subbasin, and 178,000 af from the Tracy Subbasin (ESJGBA 2014, TSGSA 2021). DWR designated the Eastern San Joaquin Subbasin in critical overdraft and the Tracy Subbasin was designated a medium-priority basin (DWR 2021).

Long-term overdraft has created opportunities for groundwater banking to the benefit of regional and statewide interests. Groundwater banking is the storage of excess water supplies into aquifers during wet periods for later withdrawal for use during dry periods. Historically, during wet periods, surface water imports have been substantial enough to satisfy irrigation and urban water needs and thus, excess water has been recharged to groundwater aquifers. The groundwater is then extracted through private and publicly owned wells located throughout the region during dry periods when local or imported surface water supplies are insufficient. Large portions of California rely on imported water from the Delta for use in groundwater banking programs. However, as drought periods increase in length, frequency, and severity the combination of increased groundwater

pumping and decreased supply of imported water for recharge may continue to reduce the efficacy of groundwater recharge as a tool to achieve groundwater basin stability.

f. Water Demand

The demand for water within the SJCOG region is serviced by a variety of water purveyors, including the irrigation districts and domestic water districts, investor-owned water companies, mutual water companies, municipalities and private well owners. The water demand summarized below represents data collected from multiple regional agencies and combines estimates from multiple years (from 2010 to 2020). Complete water demand in the SJCOG region is unknown due to the large number of private, un-metered wells as well as the multiple reporting water agencies.

Urban Demand

Table 4.11-4 summarizes estimated water demands for the urban areas in the SJCOG region. Annual water was summarized based on Urban Water Management Plans (UWMPs), water production data obtained from water service providers, or other general planning documents. Various factors determine how unincorporated portions of the SJCOG region receive their water; some unincorporated areas are located close enough to one of the cities to have connected to the cities' water infrastructure; estimates for the City of Stockton in particular include a large number of unincorporated areas connected to the City's infrastructure.

Table 4.11-4 Estimated Urban Water Demand in the SJCOG Region

Urban Areas	Estimated Urban Water Demand (afy)
RWCC Cities and incorporated areas	192,930
Tracy and incorporated areas	19,527
Total	**212,457**

AFY = Acre-feet per year
RWCC = Greater San Joaquin County Regional Water Coordinating Committee
Demand estimates cover a range of years from 2014 – 2020 and are not all from the same year
Source: Tracy 2020, ESJGA 2019, TSGSA 2021, RWCC 2020

Agricultural Demand

Agricultural water use is based on various crop evapotranspiration (ET) and efficiency data collected by DWR. The ET of a crop represents the total amount of water transpired by the plant, retained in the plant tissue, and evaporated from adjacent soil surfaces during the growing period. In dry years, the precipitation is less than normal, thus, the amount of applied water must be increased to meet the total ET of the crop. Also, the irrigation efficiency of applied water varies due to cultural practices, canal or ditched delivery, pressurized delivery systems, and soil drainage conditions. The majority of agricultural water use in the SJCOG region comes from private wells or sources managed by the Greater San Joaquin County Regional Water Coordinating Committee (RWCC); agricultural use in the Tracy area is either provided by the South Delta WA or accounted for in the Westside-San Joaquin IRWMP, which covers the small portion of the SJCOG region south and west of Tracy but stretches through multiple southern counties into Kings County. The 2020 RWCC Addendum to the 2014 IRWMP of the former ESJGBA estimates 2020 agricultural demand throughout the entire SJCOG region, including that for areas outside the RWCC planning area but within the South Delta WA, at 1,031,496 AFY (RWCC 2020), or roughly five times the estimated urban water use.

g. Flooding and Dam Inundation

Floodplains and Floodways

The risks of inundation in the SJCOG region are related to the failure of levees in the Delta, dam failures along the major rivers, and 100-year flood events. These risks of flooding are greatest during the rainy season, between November and April, yet snowmelt from the Sierra Nevada can also extend the period of time for water flows, typically between April and June. Not all levees within the SJCOG region have been built and/or maintained in accordance with federal standards as either federal flood control project levees or by local districts. The main levees protecting the Cities of Stockton, Manteca, Lathrop, and Tracy, as well as along the San Joaquin River south of the Delta are federally maintained or compliant; the Delta itself is filled with private levees. Many of the privately constructed levees are maintained by local landowners or local agencies and are in poor condition and have been identified for reconstruction or improvement to meet higher standards (ESJGBA 2014).

The 100-year floodplain denotes an area that has a one percent chance of being inundated during any particular 12-month period. Floodplain zones are determined by the Federal Emergency Management Agency (FEMA) and used to create Flood Insurance Rate Maps (FIRMs). These tools assist communities in mitigating flood hazards through land use planning. FEMA also outlines specific regulations for any construction located within a 100-year floodplain, including transportation infrastructure, such as mandatory height above 100-year floodplain levels. FEMA is currently undergoing a public comment period prior to beginning a review of current standards for floodplain management.

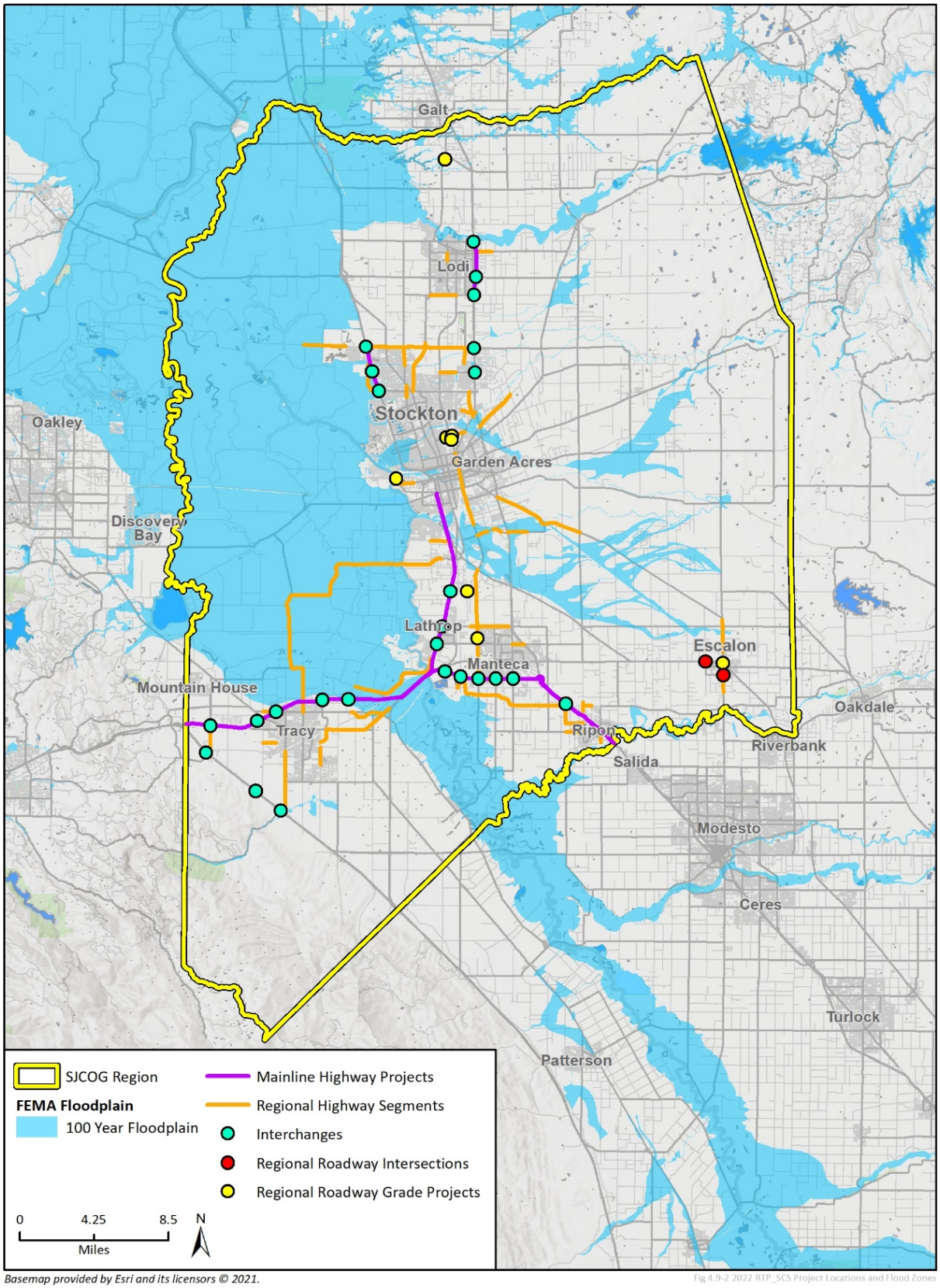
The County Office of Emergency Services (OES) has determined that over 6,600 properties within the SJCOG region are located in FEMA-designated floodplains, which are depicted on Figure 4.11-1, with over 50,000 citizens living in Special Flood Hazard Zones. In addition, most of the major highways and interstates within the SJCOG region have stretches located within flood hazard areas, including Interstates I-5, I-205, and I-580 and State Highways 4, 12, 26, 88, 99, 120, and 132. (SJCOES 2021). FEMA-declared floodways lie along all of the major watercourses in the SJCOG region, which impose further development restrictions within the designated areas designed to reduce the possibility of upstream flooding due to reduction off flood flow along the streams and rivers.

Dam Failure

The OES is responsible for developing and implementing a Flood and Dam Failure Plan that designates evacuation plans, the direction of floodwaters, and provides emergency information. The 2022 Flood and Dam Failure Plan Update is currently in draft form but does not propose major planning changes to the Flood and Dam Failure Plan. According to the OES, there are 14 dams located in and around the SJCOG region. Each of these dams has the potential to inundate portions of the SJCOG region if they were to fail. The failure of any one of these dams could result from structural instability caused by improper design or construction, instability resulting from seismic shaking, or overtopping and erosion of the dam.

Larger dams that are higher than 25 feet or with storage capacities over 50 acre-feet of water are regulated by the California Dam Safety Act, which is implemented by the California Department of Water Resources, Division of Safety of Dams (DSD). The DSD is responsible for inspecting and monitoring these dams. The Act also requires that dam owners submit to the California Office of Emergency Services inundation maps for dams that would cause significant loss of life or personal

Figure 4.11-1 100-Year Floodplains and Proposed Projects



injury as a result of dam failure. The DWR maintains Inundation Maps that depict the areas likely to be flooded in event of catastrophic dam failure and assigns the level of risk each presents. Two dams within the SJCOG region (the Gilmore Dam and New Woodbridge Diversion) are assigned a "Significant" level of risk, and the Maria Dam is assigned a "High" level of risk (DWR 2022).

4.11.2 Regulatory Setting

a. Federal Laws, Regulations, and Policies

Clean Water Act

The Federal Clean Water Act (CWA), enacted by Congress in 1972 and amended several times since, is the primary federal law regulating water quality in the United States. Congress enacted the CWA, 33 U.S.C. § 1251 et seq. (formerly the Federal Water Pollution Control Act of 1972) with the intent of restoring and maintaining the chemical, physical and biological integrity of the Waters of the United States (WOTUS). The CWA requires states to set standards to protect, maintain and restore water quality through the regulation of point source and non-point source discharges to surface water (Section 402) and the setting of water quality standards (Sections 303 and 401). Point source discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process. In general, the CWA envisions a strong enforcement power given to the States, as long as they maintain standards as good as or stricter than federal standards.

Clean Water Act Section 303(d)

Under Section 303(d) of the CWA, States are required to develop and update a list of water bodies under their jurisdiction that continue to fail to meet water quality standards even after minimum levels of pollution control have been enforced. These are referred to as '303(d) impaired' bodies. States must establish priority rankings for 303(d) impaired water bodies and develop action plans to improve water quality to minimum standards. The plans include the setting of Total Maximum Daily Loads (TMDLs) for the pollutants which are impairing the water bodies, which are total amounts of the listed pollutant which can be discharged into the body. The TMDL amounts are divided up amongst dischargers; these limits are stricter than the normal minimum standards in order to bring the impaired bodies into compliance over time. The 303(d) impaired bodies within the SJCOG region are detailed above in Table 4.11-2.

Clean Water Act Section 401

Under Section 401 of the CWA, the RWQCBs have regulatory authority over actions in WOTUS and Waters of the State of California through the issuance of water quality certifications, which are issued in conjunction with any federal permit (e.g., permits issued by the USACE under Section 404 of the CWA, described below). In effect, this section requires the issuance of certification by the RWQCB as a condition of issuance of such federal permits and provides that projects for which the State does not issue water quality certification cannot obtain other federal permits.

Clean Water Act Section 402

Section 402 of the CWA regulates point-source discharges to surface waters and requires that all construction sites on an acre or greater of land, as well as municipal, industrial, and commercial facilities discharging wastewater or stormwater directly from a point source (e.g., pipe, ditch, or

channel) into WOTUS must obtain an NPDES permit. All NPDES permits are written to ensure that the surface water receiving discharges will achieve specified water quality standards.

In California, the NPDES program is administered by the SWRCB through the RWQCBs and requires municipalities to obtain permits that outline programs and activities to control wastewater and stormwater pollution. The CWA prohibits discharges of stormwater or wastewater unless the discharge is in compliance with an NPDES permit. Municipal stormwater and wastewater discharges from Municipal Separate Storm Sewer Systems (MS4s) and all other discharges are regulated; most MS4 Permits are tailored versions of general USEPA permits, while many industrial discharge permits are individual permits created for the specific discharge requirements of the project.

The SWRCB is the permitting authority in California, issues general MS4 permits, and adopted an NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) (Order 2009-0009, as amended by Orders 2010-0014-DWQ and 2012-006-DWQ). The order applies to construction sites or other projects that include one or more acre of soil disturbance, as required by the CWA, but also to projects that disturb less than one acre but which, in the RWQCBs' determination, may pose a threat to water quality. Containment and spill cleanup are encompassed in the Storm Water Pollution Prevention Plan (SWPPP) which is required to be developed as a condition of permit issuance. The SWPPP must include measures to ensure that: all pollutants and their sources are controlled; non-stormwater discharges are identified and eliminated, controlled, or treated; site best management practices (BMPs) are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges; and BMPs installed to reduce or eliminate pollutants after construction are completed and maintained. Any project implementing the proposed 2022 TCAG RTP/SCS that disturbs more than an acre, or that the CVRWQCB determines presents a potential impact to water quality, would be required to obtain coverage under either a specific permit or the Construction General Permit.

Small amounts of construction-related dewatering is mostly covered under the Construction General Permit, but large amounts of dewatering would be required to comply with the CVRWQCB's General Dewatering Permit (Order R5-2013-0074). Dewatering related to projects implementing the proposed 2022 RTP/SCS is likely to be limited in scope, but larger projects or those which are longer in duration may require coverage under the Low Threat Discharge and Dewatering Permit from the CVRWQCB.

Clean Water Act Section 404

Under Section 404 of the Clean Water Act, proposed discharges of dredged or fill material into WOTUS require USACE authorization. WOTUS generally include tidal waters, lakes, ponds, rivers, streams, and wetlands. The USACE identifies wetlands using a multi-parameter approach, which requires positive wetland indicators in three distinct environmental categories: hydrology, soils, and vegetation. According to the USACE *Wetlands Delineation Manual (1987),* except in certain situations, all three parameters must be satisfied for an area to be considered a jurisdictional wetland. The *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (2008)* is also used when conducting jurisdictional wetland determinations in areas identified within the boundaries of the SJCOG region.

National Flood Insurance Act/Flood Disaster Protection Act

The National Flood Insurance Act of 1968 made flood insurance available for the first time. The Flood Disaster Protection Act of 1973 made the purchase of flood insurance mandatory for the

protection of property located in Special Flood Hazard Areas. These laws are relevant because they led to mapping of regulatory floodplains and to local management of floodplain areas according to guidelines that include prohibiting or restricting development in flood hazard zones. As shown in Figure 4.11-1 above, virtually all of the Delta area, as well as many other portions of the SJCOG region, lie in a Special Flood Hazard Area.

Federal Emergency Management Agency

FEMA administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA also issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection is established by FEMA. FEMA's minimum level of flood protection for new development is the 100-year flood event. Development within regulatory floodways must adhere to requirements related to the level of water surface elevation (WSE) change that may be caused by a project.

FEMA has also developed requirements and procedures for evaluating earthen levee systems and mapping the areas affected by those systems. Levee systems are evaluated for their ability to provide protection from 100-year flood events and the results of this evaluation are documented in the FEMA Levee Inventory System (FLIS). Levee systems must meet minimum standards and must be maintained according to an officially adopted maintenance plan. Other FEMA levee system evaluation criteria include structural design and interior drainage.

In 2000, FEMA adopted revisions to 44 CFR, known as the Disaster Mitigation Act (DMA) or DMA 2000. Section 322 (a-d) of the DMA 2000 requires local governments to have a Hazard Mitigation Plan (HMP) as a condition of receiving federal disaster mitigation funds. San Joaquin County's HMP includes the Flood and Dam Failure Plan Annex and the incorporated cities of San Joaquin County have adopted the County HMP.

b. State Laws, Regulations, and Policies

Porter-Cologne Water Quality Control Act

The federal CWA places the primary responsibility for the control of water pollution and planning the development and use of water resources with the states, although it does establish certain guidelines for the states to follow in developing their programs. California's primary statute governing water quality and water pollution is the Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act). The Porter-Cologne Act grants SWRCB and the nine RWQCBs broad powers to protect water quality and is the primary vehicle for the implementation of California's responsibility under the federal CWA. The Porter-Cologne Act grants the SWRCB and RWQCBs the authority and responsibility to adopt plans and policies, to regulate discharges to surface water and groundwater, to regulate waste disposal sites, and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, oil, or petroleum product. Each RWQCB must formulate and adopt a water quality control plan for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The Porter-Cologne Act also provides that an RWQCB may include in its region a regional plan with water discharge prohibitions applicable to particular conditions, areas, or types of waste.

The CVRWQCB's 'Water Quality Control Plan for the Central Valley Region-- The Sacramento River Basin and the San Joaquin River Basin' covers the SJCOG region and is the Basin Plan considered in this analysis. It includes the water quality objectives and TMDLs for the 303(d) bodies listed in Table 4.11-2, beneficial uses of the waters within the region, and an implementation plan. Major elements of the plan address concerns and objectives regarding mercury, pesticide runoff into the Sacramento and San Joaquin, salinity of both groundwater and the Delta water directed to the state's water systems, nutrient pollution, and detailed discussions of the many interactions and agreements with state and federal agencies who are also stakeholders in the critical Delta water system.

Antidegradation Policy

California's antidegradation policy, formally known as the Statement of Policy with Respect to Maintaining High Quality Waters in California, restricts degradation of surface and ground waters. It protects waters where existing water quality is higher than necessary for the protection of beneficial uses. Any actions with the potential to adversely affect water quality must be consistent with the maximum benefit to the people of the State; not unreasonably affect present and anticipated beneficial use of the water; and not result in water quality less than prescribed in water quality plans and policies. The quality of the major streams uphill of the foothill reservoirs within the TCAG region are considered suitable for all beneficial uses and of good quality, but below the dams many beneficial uses are impaired, and all groundwaters are considered suitable or potentially suitable for agricultural and industrial supply (CVRWQCB 2018).

Caltrans Statewide NPDES Permit

The California Department of Transportation (Caltrans) was issued the nation's first statewide stormwater NPDES permit (Order 99-06-DWQ) in 1999 by the SWRCB. The Caltrans Permit requires Caltrans to regulate nonpoint source discharge from its properties, facilities, and activities. The Caltrans Permit requires development of a program for communication with local agencies and coordination with other municipal separate storm sewer system (MS4) programs where those programs overlap geographically with Caltrans facilities. As part of the permit, Caltrans is required to create and annually update a Stormwater Management Plan (SWMP) that is used to outline the regulation of pollutant discharge caused by current and future construction and maintenance activities. SWMP requirements apply to discharges from Caltrans stormwater conveyances, including catch basins and drain inlets, curbs, gutters, ditches, channels, and storm drains. The SWMP must be approved by the SWRCB, and as specified in the permit, it is an enforceable document. Compliance with the permit is measured by implementation of the SWMP. Caltrans' policies, manuals and other guidance related to stormwater are intended to facilitate implementation of the SWMP. Caltrans also requires all contractors to prepare and implement a program to control water pollution effectively during the construction of all projects.

Urban Water Management Planning Act

In 1983, the California Legislature enacted the Urban Water Management Planning Act, which requires urban water suppliers to develop Urban Water Management Plans (UWMP) to actively pursue the efficient use of available supplies as well as conduct drought assessments and planning. This Act also requires the provision of water service to be affordable to lower income households. Every five years, water suppliers are required to update their UWMPs to identify short-term and long-term water demand management measures to meet growing water demands. There are

multiple UWMPs within the SJCOG region, including at least one for each of the major urban centers.

Sustainable Groundwater Management Act

In September 2014, Governor Brown signed legislation requiring that California's critical groundwater resources be sustainably managed by local agencies. The Sustainable Groundwater Management Act (SGMA) gives local agencies the power to sustainably manage groundwater. It required DWR to establish priority levels for groundwater basins within the State based on their level of overdraft, provides for the creation of regional Groundwater Sustainability Agencies (GSA) and required Groundwater Sustainability Plans (GSP) to be developed for medium- and high-priority groundwater basins. The GSPs for high-priority basins were due by January 2020 and DWR approved or rejected all of the plans by January 31, 2022. The GSPs for medium-priority basins were submitted to DWR by January 31, 2022 and await DWR approval. As discussed under *Water Management Agencies* below, the Eastern San Joaquin Subbasin was designated high priority and submitted its GSP in 2019, and the Tracy Subbasin was designated medium priority and its GSP was submitted to DWR in 2022.

Along with mandating the formation of GSAs, SGMA provided the newly formed GSAs a set of tools to assist with groundwater management, including the ability to conduct investigations, levy fees, determine a basin's sustainable yield, and measure and limit groundwater extraction within their area. However, none of the GSPs approved to-date include actions beyond public outreach/education, conducting investigations, and levying fees; some propose voluntary extraction measurement programs and clearly envision mandatory measurement programs being implemented in regional and local codes, but none dictate groundwater limits. Such action would have to be preceded by the determination of a basins' sustainable yield through exercising of their statutory investigative powers and would have to be implemented through the promulgation of regulations in a traditional legislative process. In general, adopted GSPs call for increased data-gathering, including through expanded use of voluntary or mandated metering of individual wells. Many local governments already require metering on new wells, and where this is the case many GSPs are beginning to collect that information as part of their investigative power. SGMA requires GSAs to update their GSPs every five years once approved.

Phase II Municipal Storm Water Permit

The Municipal Storm Water Permitting Program regulates storm water discharges from Municipal Separate Storm Sewer Systems (MS4s). The NPDES MS4 permits in California are issued in two phases by the SWRCB and RWQCBs.

Phase I MS4 permits are issued by the RWQCBs to medium (i.e., serving between 100,000 and 250,000 people) and large (i.e., serving more than 250,000 people) municipalities. Most of these permits are issued to a group of co-permittees encompassing an entire metropolitan area; the Stockton Urbanized Area Phase I MS4 Permit is discussed in the *Regional and Local* Setting below.

The Phase II MS4 Permit is issued by the SWRCB and is applicable to smaller municipalities (i.e., populations of less than 100,000 people) and nontraditional small MS4s (e.g., military bases, public campuses, and prison and hospital complexes). The Phase II MS4 Permit (*Waste Discharge Requirements [WDRs] for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems [MS4s] General Permit],* Order No. 2013-0001-DWQ, NPDES No. CAS000004) became effective on July 1, 2013 and covers Phase II permittees statewide. The Phase II MS4 Permit require the permittees to develop a Storm Water Management Program and individual dischargers to

develop and implement Storm Water Quality Management Plans. MS4 permits are discussed under; *c. Regional and Local Laws, Regulations, and Policies*, below.

California Construction Stormwater Permit

As the lead permitting authority in California, the SWRCB adopted an NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) (Order 2009-0009, as amended by Orders 2010-0014-DWQ and 2012-006-DWQ). The order applies to construction sites or other projects that include one or more acre of soil disturbance, as required by the CWA, but also to projects that disturb less than one acre but which, in the RWQCBs' determination, may pose a threat to water quality. The Construction General Permit authorizes the discharge of stormwater to surface waters from construction activities. It prohibits the discharge of materials other than stormwater, authorized non-stormwater discharges, and all discharges that contain a hazardous substance in excess of reportable quantities established at 40 CFR 117.3 or 40 CFR 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

The Construction General Permit requires that all developers of land where construction activities will occur over more than one acre do the following:

- Complete a Risk Assessment to determine pollution prevention requirements pursuant to the three Risk Levels established in the General Permit
- Eliminate or reduce non-stormwater discharges to storm sewer systems and other waters
- Develop and implement a SWPPP which specifies BMPs that will reduce pollution in stormwater discharges to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology standards
- Perform inspections and maintenance of all BMPs
- Conduct stormwater sampling, if required based on risk level.

Typical BMPs contained in SWPPPs are designed to minimize erosion during construction, stabilize construction areas, and control sediment and pollutants from construction materials. The SWPPP also includes a plan for inspection and maintenance of all BMPs, as well as procedures for altering or increasing BMPs based on changing project conditions.

Requirements for post-construction control of stormwater runoff are included in MS4 permits under Provision C.3, which allows permitting authorities to use the permit process to enforce appropriate source control and treatment measures in new development to address operational stormwater and wastewater discharges.

Caltrans Statewide Stormwater Permit

Any projects funded wholly or in part by the California Department of Transportation (CalTrans) would be required to comply with the CalTrans Stormwater Management Program, which ensures CalTrans project compliance with the Statewide Storm Water Permit Waste Discharge Requirements (Order Number 2012-0011DWQ, NPDES Number CAS000003). The CalTrans Stormwater Monitoring Guidance Manual, most recently updated in 2020, provides guidance on implementing the Statewide Storm Water Permit for transportation infrastructure projects and is used by many other transportation agencies.

State Senate Bills 610 and 221

State Senate Bills (SB) 610 and SB 221 (collectively referred to as the 'show me the water' laws) were adopted in 2002 and require lead agencies to obtain a Water Supply for certain projects subject to CEQA to determine the sufficiency of the water supply for a proposed development. SB 610 applies at the time an EIR is prepared, while SB 221 applies at the time a Tentative Tract Map or other related project actions are approved. Additionally, water agencies must coordinate with land use planning agencies in the development of their UWMPs, which include projections of future water demand and water supply availability during normal and dry periods. Determination of whether a WSA is required would be made for individual projects facilitated under the proposed 2022 RTP/SCS.

Assembly Bill 1881

AB 1881, the Water Conservation in Landscaping Act of 2006, enacted many landscape efficiency recommendations of the California Urban Water Conservation Council (CUWCC) for improving the efficiency of water use in new and existing urban irrigated landscapes in California. The law requires the Energy Commission to adopt performance standards and labeling requirements for landscape irrigation equipment, including irrigation controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

The Model Local Water Efficient Landscape limits the water budget for new landscapes (or rehabilitated landscapes), greater than 2,500 square feet, to 70 percent of the local reference evapotranspiration (ET). The model ordinance lays out the procedures for evaluating potential landscape water use during the land development process. In addition, the ordinance contains requirements for planting as well as the design and maintenance of irrigation systems, all with the intent of limiting outdoor water use and avoiding irrigation runoff. Municipalities and counties are required to either implement the model ordinance or one that is more stringent in their City or County Codes.

2022 Water Conservation Emergency Regulation

Due to the prolonged state of drought throughout the State, in January 2022 SWRCB adopted the Water Conservation Emergency Regulation. Requirements for the duration of the emergency regulations (currently authorized from January 18 2022 to January 18 2023) include turning off decorative water fountains, prohibiting using water hoses to clean sidewalks, and turning off irrigation systems during rain and for two days after rain. Currently the SWRCB is developing draft proposed updates to the regulation including extending the duration and banning the irrigation of non-functional turf.

Cobey-Alquist Floodplain Management Act

The Cobey-Alquist Floodplain Management Act gives support to the NFIP by encouraging local governments to plan, adopt, and enforce land use regulations for floodplain management, to protect people and property from flooding hazards. The Act also identifies requirements that jurisdictions must meet to receive State financial assistance for flood control.

California Green Building Standards Code

The California Green Building Standards Code (24 CCR, Part 11) includes mandatory measures for residential and nonresidential development. For example, Section 4.106.2 requires residential

projects that disturb less than one acre and are not part of a larger common plan of development to manage stormwater drainage during construction through on-site retention basins, filtration systems, and/or compliance with a stormwater management ordinance. Section 5.106.1 requires newly constructed nonresidential projects and additions of less than one acre to prevent the pollution of stormwater runoff from construction through compliance with a local ordinance or implementing BMPs that address soil loss and good housekeeping to manage equipment, materials, and wastes. Section 5.303 sets measures for indoor water use for non-residential development requiring metering devices to conserve water.

Delta Protection Act of 1959

The Delta Protection Act, enacted in 1959, defined the boundaries of the Delta within the Water Code of the State of California. These boundaries are often referred to as the Legal Delta. The Delta Protection Act was passed during the same legislative session as the Burns-Porter Act, which authorized construction of the State Water Project (SWP). The Delta Protection Act guarantees an adequate water supply to Delta water users and protection from increased levels of salinity due to the export of water through the CVP and SWP.

c. Regional and Local Laws, Regulations, and Policies

Water Management Agencies

The Eastern San Joaquin County Groundwater Basin Authority Integrated Regional Water Management Plan (IRWMP) formerly covered the majority of the SJCOG region and overlay the portion of the Eastern San Joaquin Subbasin that lies within the region. Currently it is inactive and the RWCC is in the process of developing a new IRWMP for the area largely based on the prior iteration. A portion of the Westside San Joaquin IRWMP area lies within the southwestern County and extends into Stanislaus County to the south. These are the two IRWMPs in the SJCOG region. The primary purpose of IRWMPs is to assist in obtaining government funding for water projects and they have no regulatory authority on their own. Management of the Delta water is performed by the Delta Watermaster who reports jointly to the SWRCB and the DSC and is facilitated by the three Delta Water Agencies who act as the water districts within the Delta itself as well as providing regulatory protection from seawater and salinity intrusion into the Delta. The Central and South Delta Water Agencies are also members of the RWCC; the South Delta Water Agency is also part of the Westside San Joaquin IRWMP.

Seventeen member GSAs came together under a Joint Exercise of Powers and formed the Eastern San Joaquin Groundwater Authority (ESJGA) which acts as the coordinator for all GSAs within the Eastern San Joaquin Subbasin. The initial agreed-upon GSP was adopted by the ESJGA in 2019 and submitted to DWR in 2020 as required by SGMA; DWR determined it incomplete in January 2022 and it is under revision.

Six GSAs formed in the Tracy Subbasin but did not sign a Joint Exercise of Powers or Memorandum of Understanding; however, they worked cooperatively to develop a single GSP and voted to appoint the County of San Joaquin as the Lead Agency and point of contact with DWR. As the Tracy Subbasin is a medium-priority basin their initial GSP was not due to DWR until January 2022; it is currently under review by DWR.

As detailed above, the Urban Water Management Planning Act requires any water provider who services more than 3,000 connections or provides over 3,000 AFY of water to prepare an UWMP every five years. There are multiple purveyors within the SJCOG region large enough to require

preparation of UWMPs but they are all members of either or both of the IRWMPs and of the two major GSA groups. As such, although urban water management in the SJCOG region occurs at the municipal level, it takes place under the umbrella of the region-wide management plans and with full co-ordination with the Delta management agencies, and the urban water needs of the SJCOG region are considered a region-wide management issue.

Delta Water Agencies

The Delta Agency was established in 1965 to maintain agricultural water quality throughout the Delta. In 1973, the agency was replaced by three distinctive agencies: North, Central, and South Delta Water Agencies. They function as water purveyors for agricultural uses within the Delta and exercise legal authority over issues related to seawater intrusion and salinity.

Delta Protection Act of 1992

The Delta Protection Act of 1992 refined the definition of the Legal Delta by designating a Primary Delta and a Secondary Delta. It also established the Delta Protection Commission (DPC) for the purpose of developing a long-term management plan for the Primary Delta, which constitutes approximately two- thirds of the Delta's area. The Land Use and Resources Management Plan for the Delta Primary Zone was adopted in 1995. The Plan provides direction for local jurisdictions in the Delta region on land use decisions. Local jurisdictions with lands in the Primary Zone are required to incorporate the Plan within their general plans and other planning activities.

Delta Reform Act

In November 2009, the California Legislature enacted the Sacramento-San Joaquin Delta Reform Act (Delta Reform Act) of 2009, also known as Sen. Bill No. 1 (SB X7-1). The Delta Reform Act created the Delta Stewardship Council (DSC). The DSC is made up of seven members that are advised by a 10-member board of scientists. The DSC is tasked with addressing the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. According to the Delta Reform Act, the coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place. The DSC regulates covered actions, as statutorily defined, to address the coequal goals.

Stockton Urbanized Area NPDES Municipal Permit

The SJCOG region includes the City of Stockton and its surrounding incorporated and unincorporated urbanized areas, which contain densely settled territory containing 250,000 or more people and are grouped together as County Service Area (CSA) 54. Due to the proximity of CSA 54 to the City of Stockton, the urbanized areas' physical interconnection to the City's storm drain system, and the locations of their discharges relative to the City's system, unincorporated San Joaquin County is designated as a part of the medium MS4 for Stockton. Any MS4 designation must comply with the CWA under the NPDES program. The City of Stockton, the urbanized areas of the County that are interconnected with the City, and the urbanized areas of the unincorporated County which surround the City are therefore referred to as the Stockton Urbanized Area and are subject to Order No. RS-2015-0024 (NPDES No. CAS083470), which is a shared NPDES permit.

The implementation of the permit requires a coordinated management effort by the City of Stockton and the County. While named as co-permittees, the City and County currently have separate programs and submit documents and reports separately to the CVRWQCB. However, the

programs are essentially identical, and the co-permittees collaborate with each other to address common issues and to ensure consistency in program development and implementation. Although the co-permittees coordinate with each other, each agency is responsible for implementing within their respective jurisdictions and their infrastructure and/or watercourses.

Other City and County NPDES Permits

There are a variety of General Orders in effect in the SJCOG region which cover and permit discharges from agricultural uses, pasture and dairy facilities, landfills and waste treatment, and so forth. These include multiple non-traditional permittees under the general State Phase II MS4 Permit including the other incorporated Cities, school districts, fairgrounds, community services districts, and Universities. Parts of the unincorporated County with small MS4 systems not covered by any other permit are in general under the Region 5 Region-Wide MS4 Permit, Order No. R5-2016-0040 (NPDES No. CAS0085324). Other relevant Orders include Order No. 2003-0003-DWQ, General Waste Discharge Requirements for Discharges to Land With A Low Threat to Water Quality and the General Dewatering Permit (Order R5-2013-0074). Dewatering related to projects programmed or proposed under the proposed 2022 RTP/SCS is likely to be limited in scope, but larger projects or those which are longer in duration may require these permits.

County and City General Plans

General Plans can be described as a city or county's "blueprint" for future development. It represents the community's view of its future; a constitution made up of the goals and policies upon which the city council, board of supervisors, or planning commission will base their land use decisions. To illustrate its importance, all subdivisions, public works projects, and zoning decisions (except in charter cities) must be consistent with the general plan. If inconsistent, they must not be approved.

State law requires that each city and each county adopt a general plan containing the following seven components or "elements": land use, circulation, housing, conservation, open-space, noise, and safety (Government Code Sections 65300 et seq.). At the same time, each jurisdiction is free to adopt a wide variety of additional elements covering subjects of particular interest to that jurisdiction such as recreation, urban design, or public facilities. All the cities in the SJCOG region have created General Plans.

Due to the large number of General Plans and the variety of locations considered for projects under the proposed 2022 RTP/SCS scenarios, this analysis will not examine every General Plan nor consider the effects of General Plans on project impacts. Projects that fall within a Sphere of Influence covered by a General Plan will be required to adhere to all applicable standards, goals, and policies outlined within that Plan; every General Plan has policies and goals related to water conservation, water quality, and water supply and most also address groundwater policies where relevant.

County and City Municipal Codes

Many local stormwater and pollutant control ordinances and requirements are contained within either the San Joaquin County Ordinance Code or the many municipal city Codes. Similar to the General Plans, the multiple Codes are too numerous and detailed to discuss within this Regulatory Setting, but virtually all municipal Codes have some regulation of stormwater and other water quality issues and address many of the potential impacts through permitting and approval processes of varying levels of complexity. It is assumed that all projects falling within incorporated areas

subject to a City Municipal Code will comply with all requirements of said Code, and all projects falling in the unincorporated areas of San Joaquin County will comply with all water quality related ordinances and regulations in the County Ordinance Code.

4.11.3 Impact Analysis

a. Methodology and Significance Thresholds

Appendix G of the State CEQA Guidelines identifies criteria for determining whether a project's impacts would have a significant impact related to hydrology and water quality, namely an analysis of whether or not the proposed 2022 RTP/SCS would:

1. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.
2. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
3. 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:
    a. Result in substantial erosion or siltation on- or off-site;
    b. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
    c. 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
    d. Impede or redirect flood flows.
4. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.
5. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

In order to determine the potential impacts of the programmatic issues considered in this EIR, information was gathered from a variety of sources and viewed in terms of both individual proposals discussed in the proposed 2022 RTP/SCS scenarios (where possible) and the overall, collective effects of the project as a whole. In general, the analysis compares the existing conditions to reasonably assumed conditions that would exist by 2046. These future conditions, in general, assume a full buildout of the programmed or proposed projects as it is not possible at this time to confirm which, if any, projects may end up being removed from future consideration. Reasonable future conditions and the change in such conditions from current conditions were then compared to the significance thresholds determined using the CEQA Guidelines.

These considerations and the magnitude of the potential change from current conditions form the basis of this analysis supplemented by area-specific conditions for individual proposed projects or groups of projects where necessary. It is not possible to compare estimated changes and adherence to requirements such as NPDES permits or GSP limitations with potential future changes in such requirements or changes in water quality regulation. For example, it is not possible at this time to compare estimates of groundwater usage and compliance with area groundwater management plans with potential future, stricter management actions or limitations as the extent and timing of

such actions are virtually unknown. Therefore, the comparisons of potential impacts to regulatory systems within this analysis assume that such regulatory systems remain in place throughout the implementation lifespan of the proposed RTP/SCS.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with projects contained within the proposed 2022 RTP/SCS. Section 4.11.3.c summarizes the impacts associated with capital improvement projects proposed in the proposed 2022 RTP/SCS. Due to the programmatic nature of proposed 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the proposed 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1:	Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality

Impact HYD-1 IMPLEMENTATION OF PROPOSED TRANSPORTATION PROJECTS AND FUTURE PROJECTS INCLUDED IN THE LAND USE SCENARIO ENVISIONED IN THE PROPOSED 2022 RTP/SCS WOULD NOT VIOLATE WATER QUALITY STANDARDS OR WASTE DISCHARGE REQUIREMENTS, OR OTHERWISE SUBSTANTIALLY DEGRADE SURFACE OR GROUNDWATER QUALITY. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Implementation of proposed transportation and land use projects envisioned in the proposed 2022 RTP/SCS would result in both short-term and long-term impacts to surface and groundwater water quality. For program-level analyses, water-related impacts are often similar among individual projects within project classes (e.g., constructing new roadways, widening existing roadways, etc.). For example, when a new roadway is constructed, it will tend to have a greater impact than the widening of an existing roadway as it would generate runoff and contamination issues where there previously were none, as well as tend to create a larger amount of new impermeable surfaces than a widening project would. Similarly, improvements within built-up urban areas are less likely to generate concerns over water body pollution than improvements outside the urban landscape, as urban areas frequently have better stormwater drainage (and potential treatment) than countryside roadways, where stormwater capture may consist of a ditch or swale along the road.

Ground Water Quality

Ground water quality can be impaired in a variety of ways, including through drawdown of shallow, nutrient-polluted agricultural runoff near over-pumped wells; overall untreated runoff from agricultural and animal operations that percolates directly into shallow aquifers; percolation of wastes from septic systems; and percolation into the water table from polluted surface water where such interchange occurs. The proposed 2022 RTP/SCS does not feature alterations to the region's agricultural land uses, and the land use proposals feature increased urban density which would not be likely to include septic usage. Therefore, the primary potential impact to regional ground water quality would be associated with impacts to surface water quality in areas where surface water is directly connected to underlying ground water supplies. Potential impacts associated with increased overdraft of ground water are discussed in Impact HYD-2.

Surface Water Quality

Certain transportation improvements would increase overall impervious surface area throughout the SJCOG region. For example, the multiple road and highway widening projects would introduce increased pavement in areas that are currently undeveloped, with corresponding increases in runoff. Construction activities for transportation projects facilitated by the proposed 2022 RTP/SCS may include soil disturbance, excavation, grading, and similar activities with a high potential to generate sediment and other pollutants. Sediment especially would not require stormwater to transport it into the environment; a high wind would be sufficient. Such projects would also serve to encourage increased use of the improved transportation network and facilitate the planned growth of the County population, leading to an increase in operational contamination from transportation use.

Development projects envisioned under the land use scenario could also introduce impervious surfaces, including infill sites, if the infill site is currently unpaved. However, it is likely that most infill sites are already developed, thus minimizing the increase of impervious surfaces. These and other more outlying projects that would increase impervious surfaces may generate adverse impacts to surface water quality. Pollutants and chemicals associated with urban activities would run off new roadway surfaces or other new impervious surfaces flowing into nearby bodies of water during storm events. These pollutants would include but are not limited to heavy metals from auto emissions, oil, grease, debris, and air pollution residues. Such contaminated urban runoff may result in the incremental long-term degradation of water quality.

Most transportation improvement projects would enhance and upgrade existing and outdated stormwater infrastructure, improving runoff quality: such benefits may be outweighed by the increases in current levels of pollutants caused by increase of traffic flows encouraged by better transportation systems. Similarly, any proposed 2022 RTP/SCS projects with landscaping may require fertilizer/pesticide application, which could enter nearby bodies of water and cause adverse effects to water quality.

As discussed under Section 4.11.2, *Regulatory Setting*, the federal CWA requires that coverage under an NPDES permit be obtained for construction projects that would disturb greater than one acre, or that are part of a larger plan of development that itself covers more than one acre. Acquisition of coverage under the Construction General Permit is dependent on the preparation of a SWPPP that contains project specific BMPs to control the discharge of pollutants, including sediment, into the local surface water drainages as well as post-construction measures to ensure continued permit compliance. In addition, all transportation projects for which Caltrans is the sponsor agency would comply with the Caltrans Statewide NPDES permit that regulates all stormwater discharges from Caltrans owned conveyances, maintained facilities and construction activities. Most proposed 2022 RTP/SCS transportation projects, such as state highway widenings and interchange construction, would disturb more than one acre and therefore subject to these regulations.

Coverage under the Region 5 Region-Wide MS4 Permit would be required for all projects and land uses during their operation that discharged to an MS4 system, including compliance with the general Findings and the Program Elements Part F (Planning and Land Development/Post Construction Storm Water Management Program) of Attachment J, such as all requirements for post-construction BMPs, LID features, and implementation or compliance with Stormwater Management Plans.

In addition, planning and approval of the various future projects envisioned by the proposed 2022 RTP/SCS would require the lead agencies and project sponsors to ensure compliance with existing local jurisdiction requirements, including applicable municipal code sections.

In addition, the land use scenario included in the 2022 RTP/SCS would generate new sources of wastewater, which would also be conveyed to wastewater treatment facilities in the region Discharges of treated wastewater, also called effluent, from the treatment plants are regulated as point sources by the RWQCB and must meet water quality effluent limitations established in the NPDES permit issued by the RWQCB for the treatment plant. Thus, although implementation of the 2022 RTP/SCS would increase the volume of point-source wastewater discharges in the SJCOG region, required compliance and monitoring of effluent prior to discharge from treatment facilities would ensure impacts would be less than significant.

Compliance with the various regulations and restrictions of the multiple types of permits individual projects may fall under, as well as conformity with applicable County or municipal General Plan policies, would serve to reduce impacts from project construction and operational lifespan by requiring measures to prevent runoff and pollutants from leaving a project site wherever it was located within the SJCOG Region, and ensuring all non-point and point source discharges to surface waters standards of the applicable NPDES Permits and Water Quality Control Plans. These measures and permit requirements may not serve to eliminate impacts to water quality for certain individual projects; however, permit coverage would ensure that the transportation and land use projects implementing the proposed 2022 RTP/SCS would not violate any water quality standards or waste discharge requirements; therefore, impacts from violation of water quality standards or waste discharge requirements, or other impairment of water quality, would be less than significant.

Mitigation Measures

No mitigation measures are required.

Threshold 2:	Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin

Impact HYD-2 IMPLEMENTATION OF PROPOSED TRANSPORTATION AND LAND USE PROJECTS ENVISIONED IN THE PROPOSED 2022 RTP/SCS WOULD SUBSTANTIALLY DECREASE GROUNDWATER SUPPLIES. AND INTERFERE WITH GROUNDWATER RECHARGE SUCH THAT IT MAY IMPEDE SUSTAINABLE GROUNDWATER MANAGEMENT OF THE BASINS. IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.

In undeveloped conditions, natural vegetation can intercept and retain precipitation and limit surface runoff, and runoff that occurs over large areas is often unconcentrated and able to percolate down into the ground and replenish groundwater supplies naturally. When natural areas, even bare dirt, are covered over by impermeable surfaces such as pavement, this natural infiltration is obstructed. Runoff from such areas is concentrated and may increase to volumes and flow rate greater than the natural infiltration rate of the surrounding soil, leading to saturated ground which cannot accept any more water and ultimately to impairment of natural recharge due to loss of otherwise rechargeable rainwater to evaporation or discharge to streams that flow to areas unable to assist recharge, or even to the oceans.

Major proposed 2022 RTP/SCS projects and the land use scenario envisioned by proposed 2022 RTP/SCS, could affect groundwater supplies by incrementally reducing groundwater recharge potential. This reduction in groundwater recharge could occur because the impermeable surfaces

associated with the proposed improvements would increase surface water runoff at the expense of natural infiltration. The proposed 2022 RTP/SCS encourages infill development within urbanized areas of the SJCOG region, and the land development envisioned could interfere with groundwater recharge by increasing the extent of impervious surfaces already present in this area. Urbanized areas are typically characterized by extensive impervious surfaces such as buildings and paved roads; as such, infill development would have minimal potential to further alter the rates and patterns of groundwater recharge to the overall basin. However, infill as well as any outlying development on currently unpaved sites would result in a net increase of impervious surfaces in the area and could have associated impacts on site specific runoff and infiltration patterns.

Land Use Projects

As development under the proposed 2022 RTP/SCS occurs, site specific drainage features would be designed to retain, capture, and convey increased runoff in accordance with the city or county design standards and State requirements, such as the Program Elements Part F post-construction site control features and hydromodification requirements of the Region-Wide MS4 Permit discussed under Section 4.11.2 *Regulatory Setting,* and Impact HYD-1, above. Compliance with these standards and regulations typically includes the use of LID features which, as described above, are designed to simulate natural processes of runoff and infiltration to minimize or avoid potential adverse effects associated with new development. Most land use development would not occur on currently permeable surface and uses that did would incorporate design features in order to reduce impacts to recharge; therefore, impacts to groundwater recharge from land use projects implementing the proposed 2022 RTP/SCS would be less than significant.

Transportation Projects

In addition to the development that would occur under the proposed 2022 RTP/SCS, transportation projects could also increase the extent of impervious surfaces. Many of the planned transportation projects, such as the addition of new lanes to existing roads or highways, would have negligible effect on the overall extent of impervious surfaces, as they would occur in areas already characterized by paved surfaces. In addition, transportation improvements often serve to increase infiltration and recharge as outdated (or nonexistent) runoff infrastructure and design is replaced by modern drainage and LID features. As with the infill development discussed above, transportation projects would also be implemented with project specific drainage plans for new features would be designed to retain, capture, and convey runoff in accordance with the city or county design standards, where applicable, and federal and State requirements. As many projects may serve to improve recharge in their area or would be required to implement design features to reduce impacts to groundwater recharge, impacts to groundwater recharge from transportation projects proposed by the proposed 2022 RTP/SCS would be less than significant.

Groundwater Supply Management

Implementation of transportation and land use projects envisioned in the proposed 2022 RTP/SCS would result in both short-term and long-term impacts to water supply throughout the SJCOG region.

Activities would be implemented under California regulations governing use of groundwater, including SGMA, as well as groundwater provisions of applicable local general plans. Taken as a whole, these regulations and plans are intended to reduce groundwater use and subsequent overdraft of groundwater basins.

Regional municipal UWMPs provide strategies for reducing water usage and increasing available supply, such as investing in reclaimed water infrastructure and increasing user education and awareness of conservation practices UWMPs cannot impose any mandatory regulations or limits on water use, and any improvements in future proposals are currently speculative.

During grading and general construction activities, water would be needed to suppress fugitive dust generated by construction equipment, for the mixing of concrete or other materials, for cleaning, and for a variety of other uses. Such water would most likely be provided by connections to urban water purveyors where feasible, or through the use of water trucks where such connection to water supply infrastructure is not feasible or possible. It is unlikely that many projects would require the installation and operation of additional groundwater extraction wells at the project locations. The SJCOG region does utilize surface water—both local and imported—as part of its water mix, but it is not possible to determine the individual water mix of surface, imported, or groundwater supply at a single project location and in the frequent case where surface water supply is reduced, groundwater is consistently relied on to make up the difference. Given the current state of overdraft of the groundwater basins in the study area and the likelihood that more than one project would be constructed simultaneously in areas with over-drafted basins, the short-term water supply impact of projects implementing the proposed 2022 RTP/SCS would be significant.

Over the long term, the water use of the proposed transportation projects would be primarily expected to consist of irrigation uses for project landscaping components as well as potable water use such as restrooms or water fountains for transit station expansions or new facilities (such as Projects Lo-12, M-23, and RTD-10). Such use would be incrementally minor for individual projects, and as most improvements involve modification of existing facilities and would not result in a substantial increase in landscaped areas that require irrigation, many may not feature any increased operational water use at all. But for those which propose to incorporate new or enhanced landscaping whether for aesthetic or structural considerations, including vegetating graded areas for slope stability and maintenance or for use as noise barriers or as part of stormwater control, or that will require permanent potable water facilities like restrooms, such water use may constitute a significant draw on regional supplies by full buildout at 2046. Although there is some current use of reclaimed water for transportation facility landscaping, this is not common region-wide. Further, in more remote areas, reclaimed water sources are not located within a reasonable distance. As such, it may not be economically feasible to convey reclaimed water to outlying areas.

The proposed land use scenario features increased projected density of municipal areas, especially near transportation hubs, as well as potential increases in the population served by projects such as when a current transit hub is increased in size and gains a large number of new users. Such increase in urban density would be accompanied by increased usage of water, potentially past that envisioned by applicable, local planning documents. As groundwater is a major source of municipal water within the region, increases in urban density would have a corresponding effect on the use of groundwater supplies throughout the region, and for much of this potential increased usage reclaimed or recycled water would not be a potential source (e.g.; drinking water).

For many of the projects, measures contained within the applicable regulatory structures or planning documents may serve to reduce or eliminate water use impacts. Most municipal NPDES permits would require implementation of LID features such as stormwater reuse (through the C.3 provision or others), and the Region-wide MS4 NPDES Permit would require projects covered under it to incorporate similar LID strategies under the general Findings and the Program Elements Part F (Planning and Land Development/Post Construction Storm Water Management Program) of Attachment J. General Plan policies and ordinances at the local and regional level, such as Green

Building Codes, would encourage or require consideration of reclaimed water and drought-resistant landscaping , and AB 1881 would apply to most landscaped areas over 2,500 sf. However, these and similar measures may not apply to every planned improvement under the proposed 2022 RTP/SCS.

Conformity with applicable GSPs in specific project areas is discussed under Impact HYD-5, below, and as discussed in Section 4.11.2, *Regulatory Setting,* and further under Impact HYD-5, the two regional GSPs in the SJCOG region do not currently contain regulatory groundwater extraction limits. In addition, neither GSP has been approved by DWR; the ESJGA GSP was determined to be incomplete and the GSP for the Tracy Subbasin is under review with a decision by DWR not due until January 31, 2024. The multiple GSAs within each basin are working cooperatively to develop their unified groundwater management strategies, and this cooperation will undoubtedly serve to assist in future comprehensive management actions, but at present the regional GSAs lack an approved GSP operational system.

Many of the regional municipal UWMPs and IRWMPs propose a variety of potential strategies for reducing water usage or increasing available supply, such as investing in reclaimed water infrastructure and increasing user education and awareness of conservation practices. Neither type of planning document, however, contains enforceable regulation. IRWMPs serve as vehicles for regional water infrastructure funding, and therefore future iterations of these documents are likely to include the upcoming transportation and land use projects envisioned by the proposed 2022 RTP/SCS scenario in their planning and may assist in continuing to propose and potentially fund improvements to the regional water supply. Similarly, UWMPs will be required to take into account growth projected from the proposed 2022 RTP/SCS in their future updates, which are required every five years, and may assist in proposing additional conservation measures based on this data. Water supply assessments under SB 610 and 221 will likewise need to take these projections into account and may serve to inform future approval of projects for which they are required based on continuing drought status (in general, water supply assessments are required to provide estimates of supply under multiple drought scenarios for 20-year horizons). But these documents cannot impose any mandatory regulations or limits on water use, and any improvements in future proposals are currently speculative.

Due to the current over-drafted state of the basins, and especially within the Eastern San Joaquin subbasin, the magnitude of change from the current conditions caused by any additional overdraft of groundwater supply would be considered significant. Therefore, short- and long-term water uses associated with the 2022 RTP/SCS would substantially decrease groundwater supplies and thereby impede sustainable groundwater management. The below mitigation measures would reduce this impact as they are not included in most LID or conservation regulatory schemes that apply within the region.

Mitigation Measures

Transportation project sponsor agencies can and should implement the following mitigation measures for applicable transportation projects. The County and cities in the SJCOG region can and should implement these measures, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions.

HYD-2(a) Construction Dust Suppression Water Supply

For all proposed 2022 RTP/SCS projects, where feasible, reclaimed and/or recycled water shall be used for dust suppression during construction activities. This includes use of such reclaimed water in

water trucks utilized for project construction occurring outside developed areas and away from water infrastructure which would otherwise provide such reclaimed water. It should be noted that use of reclaimed water in water trucks is generally no different than use of potable water, and therefore use of reclaimed water in projects that will require the use of water trucks should be given extra consideration as a measure which can enable use of reclaimed water in areas where it would otherwise be impossible due to lack of infrastructure. This measure shall be noted on construction plans and shall be spot checked by the local jurisdiction.

HYD-2(b) Landscape Watering

In jurisdictions that do not already have an appropriate local regulatory program related to landscape watering, or for proposed 2022 RTP/SCS projects that are not required to comply with AB 1881, projects that include landscaping shall be designed with drought tolerant plants and drip irrigation. When feasible, native plant species shall be used. In addition, landscaping associated with proposed improvements shall be maintained using reclaimed water when feasible. If reclaimed water could feasibly be utilized for project landscape watering due to proximity of reclaimed water sources but is unavailable due to lack of connecting infrastructure, local agencies or transportation sponsors shall conduct an analysis of the upgrades needed to provide such infrastructure, which will include the potential for new connections to existing reclaimed water systems to provide reclaimed water to other nearby sources besides the proposed project in the analysis, and shall perform such steps as necessary to utilize available reclaimed water if feasible.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate.

Significance After Mitigation

Implementation of the above measures would reduce proposed Project impacts on water supply and groundwater overdraft in the SJCOG region. However, due to the programmatic nature of this proposed 2022 RTP/SCS EIR, a precise, project-level analysis of specific water demand and supply impacts associated with individual transportation and land use projects is not possible. The land use scenario envisioned by the proposed 2022 RTP/SCS along with transportation projects would result in the need for additional water supply, even with the implementation of mitigation measures listed above. Given the overdraft conditions of area groundwater basins, impacts would remain significant and unavoidable. No additional feasible mitigation measures to reduce this impact to a less than significant levels is available.

Threshold 3:	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 substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; 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 impede or redirect flood flows

Impact HYD-3 TRANSPORTATION AND FUTURE LAND USE PROJECTS IMPLEMENTING THE PROPOSED 2022 RTP/SCS WOULD NOT SUBSTANTIALLY ALTER THE EXISTING DRAINAGE PATTERN OF A SITE OR AREA THROUGH ALTERATION OF THE COURSE OF A STREAM OR RIVER OR THROUGH THE ADDITION OF IMPERVIOUS SURFACES IN A MANNER WHERE DRAINAGE CHANGES WOULD RESULT IN FLOODING ON- OR OFF-SITE, REDIRECT OR IMPEDE FLOOD FLOWS, EXCEED THE CAPACITY OF STORMWATER SYSTEMS, OR PROVIDE ADDITIONAL POLLUTED RUNOFF. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Construction of transportation and development projects under the proposed 2022 RTP/SCS could result in the change of existing drainage patterns on individual project sites or within a project area, which could impact water quality. Project grading and construction of impervious surfaces for transportation projects may alter existing drainage patterns by altering slopes, increasing impervious surface and reducing infiltration. Additionally, infill development projects included in the SCS land use scenario could also increase impervious surfaces and develop structures that may alter existing drainages. Projects that include improvements on or near bridges may result in fill material being placed within the stream channel, although it is unlikely that any of the proposed projects would necessitate or result in actual alteration of a streambed or course. Additionally, many projects would feature some level of risk of sediment loading and erosion which could further alter drainage patterns within the immediate area. Implementation of proposed transportation and land use projects implementing the proposed 2022 RTP/SCS may increase or redirect stormwater flows, resulting in increased volume and/or velocity of stormwater runoff. Potential increases in stormwater volume and/or velocity could result in on- or off-site flooding.

However, planned transportation and land use projects would be designed to comply with existing State and local jurisdiction requirements, included applicable County and municipal code sections related to stormwater runoff and drainages, such as curb and gutter design, and would be required to build drainage infrastructure if necessary to control and accommodate the increase in stormwater flows. Effects of increased polluted runoff have already been examined in this EIR, including under Impact HYD-1 specifically, and runoff from drainage changes would be included under those overall runoff impacts. Any streambed filling would be required to comply with the terms of any applicable USACE 404 or RWQCB permit which would include an analysis of any impacts from flooding or drainage alteration. Oversight of projects within flood areas or affecting flood control infrastructure would be provided by the San Joaquin County Flood Control and Water Conservation District (or the San Joaquin Area Flood Control Agency in the Stockton Urbanized Area) and would ensure potential impacts related to alteration of future flood flows were minimized.

Land use projects under proposed 2022 RTP/SCS in incorporated areas would require drainage control and hydromodification measures required either under an individual MS4 NPDES Permit or under the Region-Wide NPDES MS4 permit and would include implementation of LID drainage control features if required under Program Requirement Part F or under a C.3 provision, as well as any hydromodification requirements related to drainage flow rate control, stormwater system capacity, and similar hydrologic concerns. These measures would typically include incorporation of

permeable paving, vegetated swales, infiltration retention basins and other features that would minimize stormwater runoff or velocity and are selected from sets of feasible options based on project-specific site or engineering characteristics. Similar sets of requirements may further be imposed by local regulatory programs as discussed under Section 4.11.2, *Regulatory Setting,* above.

Compliance with the existing suite of applicable regulations minimize impacts related to on- or off-site flooding, stormwater drainage capacity, polluted flood runoff, and redirection or impedance of flood flows, and such impacts would therefore be less than significant.

Mitigation Measures

No mitigation measures are required.

Threshold 4:	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation

Impact HYD-4 TRANSPORTATION S AND LAND USE PROJECTS IMPLEMENTING THE PROPOSED 2022 RTP/SCS WOULD NOT RISK RELEASE OF POLLUTANTS DUE TO PROJECT INUNDATION IN FLOOD HAZARD, TSUNAMI, OR SEICHE ZONES. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

In the SJCOG region, the dam inundation areas lie within the natural floodplains and therefore this analysis considers the effects of flooding and dam failure to be similar. There is virtually no risk of tsunami within the SJCOG region, due to its distance from the coast. Seiche behavior could be possible in the larger reservoirs after a major earthquake or similar event that causes large-scale disturbance to the waters. Due to the size of the reservoirs within the SJCOG region, seiche waves which topped the dams and flowed downstream would be expected to be much smaller than the flood from a dam failure or flooding from heavy rains. Therefore, regulatory requirements which serve to reduce impacts on floodplains or from dam failure would apply equally to seiche impacts within the SJCOG region.

There are several federal, state and local programs to reduce flooding and control the flow of floodwaters, as well as to encourage proper flood planning in project design within the region as discussed in the Regulatory Setting. The National Flood Insurance Act makes the purchase of flood insurance mandatory for properties in Special Flood Hazard Areas. The Cobey-Alquist Floodplain Management Act encourages local governments to plan, adopt and enforce land use regulations for floodplain management. The California Division of Dam Safety inspects dams across the State, including in the SJCOG region, on a yearly schedule to ensure that they are performing and being maintained in a safe manner. The San Joaquin Flood Control and Water Conservation District manages flood control projects in the unincorporated County, currently operating flood control repair and maintenance projects in the two largest flood districts (Zone 9 and Zone 10). In addition, the San Joaquin Area Flood Agency (of which the Flood Control and Water Conservation District is a member agency) covers the City of Stockton, the Urbanized Area, and since 2017, has covered the Cities of Lathrop and Manteca. While many private levees and flood control infrastructure throughout the SJCOG region are in poor condition, those maintained by either of the main flood control agencies fulfill FEMA standards and qualify for federal and state funding under the appropriate regulations.

Land use changes envisioned within the SCS could occur within flood zones, especially in the City of Stockton and the Urbanized Area. These would mostly occur within developed areas or on the edges of such areas and would therefore be connected to existing or planned stormwater and flood control infrastructure and be required to conform with applicable regulations regarding runoff

control and pollution control, including the mitigation measures proposed in this EIR. Such development would not substantially interfere with existing flood infrastructure without separate project-specific analysis of such impacts and the impacts of potential runoff to water quality have already been examined and mitigated to the greatest extent feasible. The impacts of urban development increase the risk of flood inundation and the release of pollutants due to such inundation due to the increase in impermeable surfaces. This impact would be less than significant. A greater risk of impact would arise from the transportation projects in less developed areas with less extensive flood protection or capability to deal with potential polluted runoff from roadways during a flood event. Locations of transportation improvements proposed in the proposed 2022 RTP/SCS within floodplain areas of the region are depicted in Figure 4.11-1.

However, all such projects within floodplain or dam inundation areas would be required to adhere to any development restrictions or regulations enforced by the two primary flood control agencies, and projects within municipal areas would need to comply with hydromodification regulations of the municipal Flood Control or Public Works Department for drainage and stormwater flooding. The implementation of SWPPP plans and BMPs imposed through these or other regulatory plans, as well as the requirements to improve local stormwater flow capacity if needed, would serve to mitigate the risks of flooding to these projects to the greatest extent feasible. Unlike in an urban area, where floodwaters might put pollutants normally safe from rain flows at risk, except in extraordinary circumstances, the amount of pollution being washed off a roadway in a flood would be the same as that washed off in a heavy rain, as most pollutants on roads are contaminants like motor oil, metals from brake pads, trash, and similar debris. It is possible floodwaters would rise high enough to overcome drainage ditches, bioswales and similar pollution-capturing systems alongside roadways and bridges but such situations would distribute relatively few pollutants (those immediately extant on the road stretch being flooded) over a large area and would have a lesser impact than the long-term impacts of constant runoff from the roadways that is already mitigated by runoff control devices.

Although individual projects implementing the proposed 2022 RTP/SCS have the potential to adversely affect water quality at a project-specific level due to floodwater inundation, projects would adhere to existing regulations regarding risks from water quality pollutants and flood surges. The risks from polluted runoff during flood events would be similar to those of rain events on countryside roadways, and while greater in developed areas, would likewise be more regulated and surrounded by infrastructure better able to deal with such flows.

The types of development that would be most likely to result in release of pollutants during inundation include uses such as wastewater treatment plants, chemical manufacturing plants, or hazardous materials landfills. Generally, the proposed 2022 RTP/SCS envisions land development in already urbanized areas where wastewater treatment plants, landfills, and chemical manufacturing plants already exist to serve existing development. Accordingly, the land use projects envisioned in the proposed 2022 RTP/SCS would not substantially increase the risk of release of pollutants into the environment as a result of inundations.

Based on the above analysis, water quality impacts of the proposed 2022 RTP/SCS due to flooding or dam failure would be less than significant.

Mitigation Measures

No mitigation measures are required.

Threshold 5:	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan

Impact HYD-5 TRANSPORTATION AND LAND USE PROJECTS IMPLEMENTING THE PROPOSED 2022 RTP/SCS WOULD NOT CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF A WATER QUALITY CONTROL PLAN OR SUSTAINABLE GROUNDWATER MANAGEMENT PLANS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Implementation of transportation and land use projects implementing the proposed 2022 RTP/SCS would affect water quality, but there is nothing in the proposed 2022 RTP/SCS which would prevent the CVRWQCB or any applicable local agency from carrying out the regulatory provisions of the Basin Plan. The transportation projects included in the proposed 2022 RTP/SCS would not conflict with the beneficial uses for water identified in the Basin Plan. For example, transportation projects would not interfere with the beneficial use of water for municipal and domestic supplies, agricultural supply, or wildlife habitat supply. Likewise, the land use scenario envisioned in the proposed 2022 RTP/SCS would not obstruct or conflict with beneficial uses of water in the water quality control plan. The land use scenario in the proposed 2022 RTP /SCS focuses on infill development and locating people and employment near transit. The infill characteristics of the land use scenario would generally be consistent with the past use of water in these areas, and supportive of the beneficial uses identified in the water quality control plan, such as municipal and domestic supplies.

Primary goals of the Basin Plan include management of the 303(d) listed bodies, maintenance of water throughout the SJCOG region for designated beneficial uses, and management of salt concentrations within the groundwater subbasins (CVRWQCB 2018). It is unlikely that project implementation would have any effect on the attainment of these main goals at this time, and new development and improvements facilitated by the project would be required to maintain adherence with changes in the Basin Plan as they are planned in the future. Transportation projects with a potential for affecting 303(d) impaired water bodies (listed in Table 4.11-2) would be strictly regulated and are unlikely in general to produce the kinds of pollutants for which the bodies are mostly impaired, which tend to be the result of agricultural and urban pollution. Although the project buildout may affect groundwater supplies, as detailed above, it is not likely to cause a change in the ability of County groundwater to maintain its beneficial use. Impacts to beneficial uses of 303(d) impaired bodies would be expected to be less than significant in the same vein as impacts to listed pollutant levels. Should individual projects be likely to cause substantial impacts to water quality, the CVRWQCB would have authority to mandate limitations or monitoring of discharges under the applicable SWPPP required by an NPDES Permit or imposed by CVRWQCB for smaller projects deemed a threat to water quality. Finally, the Basin Plan in general monitors salt concentrations through specific conductivity measurements and sets maximum conductivity levels for the San Joaquin, Feather, Sacramento, and American Rivers at various checkpoints, as well as at several area lakes and with separate requirements for the Delta. Similarly, to constituents of concern in the 303(d) bodies, various salts and constituents increasing ionic content and specific conductivity in receiving waters are more commonly associated with agriculture than with transportation (in areas that do not regularly freeze and require heavy applications of road salts). Should individual projects be likely to cause potential substantial impacts to the salinity of receiving waters, the CVRWQCB would have authority to mandate limitations or monitoring of discharges for salinity under the SWPPP required by the General Permit (or imposed by CVRWQCB for smaller projects deemed a threat for salinity).

The land use pattern included in the proposed 2022 RTP/SCS would generate new sources of wastewater, which would also be conveyed to wastewater treatment facilities in the region for secondary or tertiary treatment. Discharges of treated wastewater, also called effluent, from the treatment plants are regulated by the CVRWQCB and must meet water quality effluent limitations established in the applicable NPDES/WDR permits for point source discharges, as also discussed under Impact HYD-1, above. Thus, although implementation of the proposed 2022 RTP/SCS would increase the volume of point-source wastewater discharges in the SJCOG region, required compliance and monitoring of effluent prior to discharge from treatment facilities would ensure Basin Plan compliance and impacts would be less than significant.

Implementation of the proposed 2022 RTP/SCS will not obstruct or hinder CVRWQCB or municipal agencies from fulfilling their regulatory duties and would be required to comply with all statues, codes, and regulations that applied. Further, the scenarios envisioned in the proposed 2022 RTP/SCS would not conflict with the stated goals of the Basin Plan. Therefore, impacts of the proposed project to implementation of any water quality control plan would be less than significant and no mitigation is required.

Regarding impacts on sustainable groundwater management plans, as discussed under Impact HYD-2, implementation of the proposed 2022 RTP/SCS would likely have an impact on groundwater levels and supply. As detailed under the *Regulatory Setting*, groundwater management within California in general falls under SGMA. Of the two primary GSPs in the SJCOG region. The ESJGA was submitted for DWR review and has been determined incomplete and must undergo further revision, while that for the TSGSA is currently in the process of undergoing DWR review with approval or disapproval anticipated by 2024.

As discussed under Section 4.11.2, *Regulatory Setting,* along with information-gathering, setting of fees, and determining sustainable yields, the primary regulatory tool provided to GSAs under SGMA is the ability to set and enforce area-specific mandatory groundwater pumping limitations through regular updates to GSPs for medium- and high-priority groundwater basins. DWR-approved GSPs are required to provide mechanisms that allow the sustainable use of groundwater, with growth projections considered, and the first set of adopted and DWR-approved GSPs are focused on measuring extractions to obtain the necessary data to determine sustainable yields. This is also the emphasis in the two GSPs proposed for the SJCOG region, along with determination of applicable fees and numerous proposed public outreach and conservation policies.

After gaining DWR approval and then determining sustainable yields through the next planning cycles, the GSPs may begin to incorporate mandatory monitoring, pumping limitations, or other groundwater sustainability policies based on their determined sustainable yields. Projects being implemented under the proposed 2022 RTP/SCS would be required to conform with any new applicable regulations supporting groundwater use and sustainable groundwater management. Therefore, water use facilitated by the proposed 2022 RTP/SCS would not obstruct any current GSP in the SJCOG region, as any increase in water demand that would result from the proposed 2022 RTP/SCS land use plan would be subject to monitoring requirements or other limitations as set forth in the applicable GSPs, including the addition of new monitoring devices as needed on existing or new wells utilized by any projects if required by the GSAs. This impact would be less than significant.

Further, the existing regulations and permit requirements regarding water usage, LID, stormwater recapture and similar water conservation issues serve to ensure that projects implemented under any of the various proposed 2022 RTP/SCS scenarios will conform as best possible with the overall stated goals of the multiple GSPs in terms of water conservation and monitoring as well. Therefore,

impacts of the proposed project to sustainable groundwater management goals and plans will be less than significant and mitigation will not be required.

Mitigation Measures

No mitigation measures are required.

c. Specific proposed 2022 RTP/SCS Projects That May Result in Impacts

All proposed 2022 RTP/SCS transportation projects that require new construction or landscaping would result in at least some of the impacts discussed in impacts HYD-1 through HYD-5; and therefore, are not specifically identified as having individual potential impacts. The proposed 2022 RTP/SCS projects are listed in Chapter 2. Additional specific analysis would be required as individual projects are implemented to determine the project specific magnitude of impact.

4.11.4 Cumulative Impacts

The cumulative impact analysis area for hydrology and water quality encompasses the watersheds and groundwater basins affected by the transportation projects and land use pattern envisioned in the proposed 2022 RTP/SCS, including creeks and drainages, floodplains, and aquifers. Therefore, the cumulative impact assessment area consists of the SJCOG region and the adjoining counties, which encompasses the applicable watersheds and basins.

Cumulative development would increase erosion and sedimentation resulting from grading and construction, as well as changes in drainage patterns which could degrade surface and ground water quality. In addition, new development would increase the generation of urban pollutants that may adversely affect water quality in the long term. As with the proposed 2022 RTP/SCS, individual construction projects within the cumulative impact area would be required to comply with applicable water quality regulations. Compliance with these existing requirements would reduce project level impacts throughout the cumulative impact area; as such, cumulative impacts related to water quality would be less than significant, and the proposed 2022 RTP/SCS contribution to this impact would not be cumulatively considerable.

Development within the cumulative impact area would increase impervious surfaces and reduce groundwater infiltration. However, counties and cities in the cumulative impact area have regulatory requirements for stormwater management, effectively requiring minimization of stormwater runoff. Because the volume of runoff would be reduced by these regulations, as well as State and federal regulations, precipitation would be retained on individual project sites and infiltrated or treated and discharged to swales, creeks, or other drainages. The proposed 2022 RTP/SCS contribution to cumulative groundwater recharge impacts would not be cumulatively considerable. Development within the cumulative impact area would substantially decrease groundwater supplies by increasing the amount of overdraft throughout critically over-drafted basins, impeding sustainable groundwater management. In addition, as the various watersheds and subbasins within the SJCOG region are part of the larger San Joaquin River HR, and basin delineations are often based on political divisions and not hydrologic connectivity, impacts on groundwater levels in the SJCOG region would be expected to have corresponding impacts on levels in basins outside of the SJCOG region, and vice versa, as a result of buildout of the proposed 2022 RTP/SCS, with corresponding impacts to water management. Therefore, cumulative impacts related to groundwater supply would be significant and the proposed 2022 RTP/SCS contribution to this impact would be cumulatively considerable pre -mitigation. Mitigation measures HYD-2(a) and HYD-2(b) would reduce this impact, but it would remain cumulatively considerable after mitigation.

Development within the cumulative impact area could result in incremental modifications over time that can have cumulative adverse effects on drainage in the cumulative impact area by impeding and displacing flood flows, contributing incrementally to surface drainage runoff or degrading water quality, and the capacity of a drainage way to carry flood flows and/or the overall quality of the water may be cumulatively affected. New development envisioned under the proposed 2022 RTP/SCS and associated impervious cover could also be potentially significant on a cumulative basis if it would contribute to a significant increase in the overall net impervious surface throughout the region which leads to changes in regional drainage patterns. As discussed in Impact HYD-3, projects implementing the proposed 2022 RTP/SCS would be required to maintain pre-project hydrology and projects that would disturb more than one acre would be subject to requirements that prevent increase in runoff flows. These drainage requirements would minimize the contribution of the proposed 2022 RTP/SCS to cumulative drainage impacts, and the contribution of the proposed 2022 RTP/SCS to these impacts would not be cumulatively considerable.

Development within the cumulative impact area may occur within floodplains and floodways and may include development of projects such as industrial parks, wastewater treatment plants, hazardous materials storage, or other infrastructure which may pose a release of pollutants as a result of inundation. Implementing agencies would conduct or require project-specific hydrology studies for projects proposed to be constructed within floodplains to demonstrate compliance with Executive Order 11988 (for federally funded projects), the NFIP, the National Flood Insurance Act, and the Cobey-Alquist Floodplain Management Act, as well as any further FEMA or State requirements that are adopted at the local level. These studies would identify project design features that reduce impacts on either floodplains or flood flows that would be required through the permitting process, as well as requiring measures to reduce the risk of pollutant release from inundation. Therefore, the cumulative effects of risk of polluted runoff from flood inundation is less than significant. The land use development envisioned in the proposed 2022 RTP/SCS would not substantially increase the risk of release of pollutants into the environment as a result of inundations, as it would have to comply with the local, state, and federal requirements described above and there are no projects proposed which pose a release of pollutants as a result of inundation. Therefore, the contribution of the proposed 2022 RTP/SCS to these impacts would not be cumulatively considerable.

All of the cumulative impact area lies within the CVRWQCB and falls under the Basin Plan. All development within the Basin Plan area must comply with the goals, beneficial uses, and 303(d) limitations outlined in the Plan, as well as falling under the authority of any Orders issued by CVRWQCB. Therefore, the cumulative impact to obstruction of the Basin Plan is less than significant, and the proposed 2022 RTP/SCS's contribution to this impact would not be cumulatively considerable. There are multiple individual GSAs within the cumulative impact area. Each development within the cumulative area would only fall under management actions required by the GSA approved within its individual area. By its nature, SGMA emphasizes local action and not regional management. Although some of the groundwater basins within the cumulative impact area are hydrologically connected, individual GSAs only have authority over their defined geographic areas, and although each basin in the SJCOG area falls generally under a single joint GSP, many other basins have multiple GSAs covering different portions of the basin. Therefore, cumulative impacts throughout the analysis area could not serve to obstruct any GSPs other than those in effect in their immediate area (for example, a project exclusively using water generated by purveyors in one GSA area with its specific available yield could not obstruct the monitoring or pumping limitations of a GSP in effect in a different area, with a different sustainable yield, even if they were both within the same groundwater basin), and cumulative impacts to obstruction of GSPs is less than significant. The

proposed 2022 RTP/SCS could not obstruct or interfere with any GSP in effect outside of its own area and would be required to adhere to all requirements of the individual GSPs within its area based on individual project location, and therefore its contribution to impacts to obstruction of GSPs in the cumulative area would not be cumulatively considerable.

4.12 Land Use and Planning

This section evaluates potential impacts of 2022 RTP/SCS associated with physically dividing an established community and causing a significant environmental impact due to a conflict with a land use plan, policy, or regulation.

4.12.1 Setting

a. Land Use Patterns

The SJCOG region is 1,440 square miles, with an estimated population of 783,534; it is located in the San Joaquin Valley in central California. Much of the SJCOG region is flat and generally used for agriculture, with the exception of the Diablo Foothills in the southwest corner of the region and the Sierra Nevada foothills along the region's eastern boundary. The region is home to seven incorporated cities (Escalon, Lathrop, Lodi, Manteca, Ripon, Stockton, Tracy). Figure 4.12-1 shows the San Joaquin County boundary, as well as the incorporated cities and unincorporated communities within the SJCOG region.

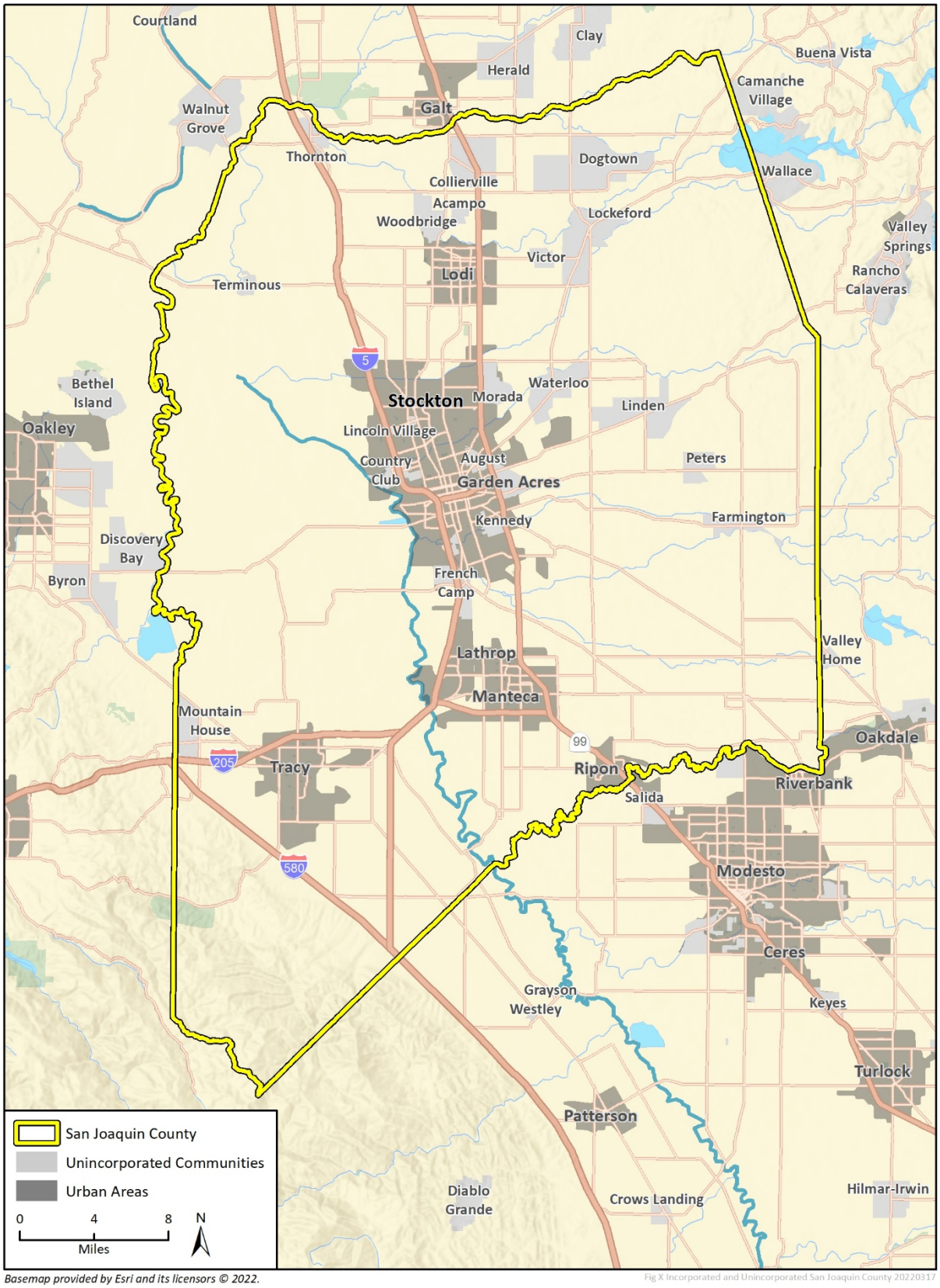
Cities within SJCOG region have experienced outgrowth from the San Francisco Bay Area. The cities experiencing the most substantial growth from this phenomenon are Stockton, Tracy and Manteca. Currently, Stockton is the financial, governmental, cultural, and commerce center of the SJCOG region, and is the largest urban center in the SJCOG region, with an approximate 2021 population of 320,876 (DOF 2021). However, with few exceptions, much of the Valley remains agricultural and rural in character. Stockton is a major regional transportation hub, home to an extensive railroad network and the largest inland deep-water port in California. Unincorporated communities and other communities are separated by agricultural land uses and open space. Within San Joaquin County, most population growth and development occur within and in close proximity to previously existing communities. Although the County is predominately dominated by agricultural uses, urbanized areas comprise a small portion of the County.

As required by law, each incorporated city in the SJCOG region, as well as San Joaquin County for the unincorporated areas, has a general plan containing at minimum seven statutorily required elements, among them a land use element and housing element that designate appropriate land uses throughout the jurisdiction, accommodate each jurisdiction's share of the regional housing need and define specific goals, policies, and objectives that the local jurisdiction has determined to be important.

4.12.2 Regulatory Setting

Numerous federal, State, and local laws, regulations, policies, programs, plans, codes, and ordinances regulate land use in the SJCOG region. Local land use issues are regulated by the general plans, specific plans, and zoning ordinances adopted by San Joaquin County and the incorporated cities within the County. The SJCOG itself is landlocked, surrounded by Sacramento County to the north, Stanislaus County to the south, Calaveras County and Amador County to the east, and Contra Costa County and Alameda County to the west. Thus, it is not within the immediate proximity of any local, state, or national costal zones.

Figure 4.12-1 SJCOG Planning Area



Basemap provided by Esri and its licensors © 2022.

Fig X Incorporated and Unincorporated San Joaquin County 20220317

a. Federal and State Laws, Regulations, and Policies

Code of Federal Regulations Title 25

Federally recognized Native American tribes are considered domestic dependent nations tribal sovereignty. "Tribal sovereignty" refers to tribes' right to govern themselves, define their own membership, manage tribal property, and regulate tribal business and domestic relations; it further recognizes the existence of a government-to-government relationship between such tribes and the federal government. In general, State and local governments do not have "civil regulatory" jurisdiction (i.e., land use) on Indian Land, which is land held in trust or restricted status for a tribe.

Sustainable Communities Strategy and Climate Protection Act (SB 375)

SB 375 is a California law passed in 2008 that requires each MPO to demonstrate, through the development of a Sustainable Communities Strategy (SCS), how its region will integrate transportation, housing, and land use planning to meet the greenhouse gas (GHG) reduction targets set by the State.

In addition to creating requirements for MPOs, it also creates requirements for CTC and CARB. Some of the requirements include the following:

- CTC must maintain guidelines for the travel demand models that MPOs develop for use in the preparation of their RTPs or MTPs.
- CARB must develop regional GHG emission reduction targets for automobiles and light duty trucks for 2020 and 2035 by September 30, 2010. These targets were approved on September 23, 2010. CARB is tasked to update the regional targets every eight years, with the option of revising them every four years. The latest targets were approved on March 18, 2018 and went into effect October 1, 2018.
- Each MPO must prepare an SCS as part of its RTP or MTP to demonstrate how it will meet the regional GHG targets.
- Each MPO must adopt a public participation plan for development of the SCS that includes informational meetings, workshops, public hearings, consultation, and other outreach efforts.
- If an SCS cannot achieve the regional GHG target, the MPO must prepare an Alternative Planning Strategy (APS) showing how it would achieve the targets with alternative development patterns, infrastructure, or transportation measures and policies.
- Each MPO must prepare and circulate a draft SCS at least 55 days before it adopts a final RTP or MTP.
- After adoption, each MPO must submit its SCS to CARB for review.
- CARB must review each SCS to determine whether, if implemented, it would meet the GHG targets. CARB must complete its review within 60 days.

SJCOG reduced GHG emissions to meet the target set by CARB from 2005 levels by 2020, achieving a 12 percent per capita reduction for 2020 (SJCOG 2021) and is targeting a 16 percent per capita reduction from 2020 levels by 2035 (SJCOG 2021). These targets apply to the entire SJCOG region for all on-road light duty trucks and passenger vehicles emissions, and not to individual cities or sub-regions. Therefore, SJCOG, through the 2022 RTP/SCS, must continue to reduce these levels to meet the 2035 target. The 2022 RTP/SCS includes the years for which the regional targets are required (base year/2021 and 2035) and the 2022 RTP/SCS also includes the additional scenario year of 2045

to comply with federal law. The 2022 RTP/SCS meets the 2035 and would very likely meet the 2045 GHG targets.

SB 375 specifically states that nothing in the law changes local governments local land use authorities. The 2022 RTP/SCS provides a regional policy foundation that local governments may build upon if they so choose. The 2022 RTP/SCS includes and accommodates the growth projections for the region. SB 375 also requires that forecasted development patterns for the region be consistent with the eight-year regional housing needs as allocated to member jurisdictions through the Regional Housing Needs Allocation (RHNA) process under State housing law.

In addition, this 2022 RTP/SCS EIR lays the groundwork for the streamlined review of qualifying development projects. Qualifying projects that meet statutory criteria and are consistent with the 2022 RTP/SCS are eligible for streamlined environmental review pursuant to CEQA under SB 375 and other laws; see Section 1.4.1. Office of Planning and Research 2017 General Plan Guidelines.

Office of Planning and Research 2017 General Plan Guidelines

The 2017 General Plan Guidelines (Governor's Office of Planning and Research 2017) is the first comprehensive update to the guidelines since 2003 and addresses numerous new laws, requirements, resources and research that affect long-range planning in California. The 2017 update includes links to external documents and additional resources. This includes guidance for implementing the following legislation: Environmental Justice (SB 1000), Climate Change (SB 379), Sustainable Communities Strategies (SB 375), Flood Management (SB 5), Vehicle Miles Traveled (SB 743), Island or Fringe Communities (SB 244), Tribal Consultation (AB 52) and Local Hazard Mitigation Plans (AB 2140). Beyond State law requirements, the 2017 General Plan Guidelines also provide direction on topics including healthy communities, equitable and resilient communities, economic development, climate change and renewable energy.

Smart Mobility 2010 Framework

The Smart Mobility Framework, formally known as *Smart Mobility 2010: A Call to Action for the New Decade* (Caltrans 2010), was prepared by Caltrans in partnership with the U.S. EPA, the Governor's Office of Planning and Research, and the California Department of Housing and Community Development to address both long-range challenges and short-term programmatic actions to implement multi-modal and sustainable transportation strategies in California. The Smart Mobility Framework helps guide and assess how well various levels plans, programs, and projects (e.g., RTPs, General Plans, specific development proposals, etc.) meet a definition of "smart mobility". The Smart Mobility Framework is intended to move people and freight while enhancing California's economic, environmental and human resources by emphasizing:

- Convenient and safe multimodal travel
- Speed suitability
- Accessibility
- Management of the circulation network
- Efficient use of land

Planning and Zoning Law

California Government Code Section 65000, et seq., regulates the substantive and topical requirements of general plans. State law requires each city and county to adopt a general plan "for

the physical development of the county or city, and any land outside its boundaries which bears relation to its planning." The California Supreme Court has called the general plan the "constitution for future development." The general plan expresses the community's development goals and embodies public policy relative to the distribution of future land uses, both public and private.

Zoning authority originates from city and county police power and from the Planning and Zoning Law, which sets minimum requirements for local zoning ordinances. Zoning ordinances must be consistent with the general plan and specific plans. The consistency requirement does not apply to charter cities other than Los Angeles unless the charter city adopts a consistency rule.

Cortese Knox Hertzberg Local Government Reorganization Act of 2000

The Cortese Knox Hertzberg Local Government Reorganization Act (CKH Act) is the most substantial reform to local government reorganization law since the 1963 statute that created a LAFCO in each county. The law established procedures for local government changes of organization, including city incorporation, annexation to a city or special district, and consolidation of cities or special districts (Section 56000, et seq.). LAFCOs have numerous powers under the CKH Act, but those of prime concern are the power to act on local agency boundary changes and to adopt spheres of influence (SOIs) for local agencies. The law also states that to update an SOI, LAFCOs are required to first conduct a review of the municipal services provided in the SJCOG region.

Senate Bill 743

SB 743 changes the way that public agencies evaluate the transportation impacts of projects under CEQA, recognizing that roadway congestion, while an inconvenience to drivers, is not itself an environmental impact (see Pub. Resource Code, § 21099, subd. (b)(2)). SB 743 provides opportunities to streamline CEQA for qualifying urban infill development near major transit stops in metropolitan regions statewide. A transit-oriented infill project can be exempt from CEQA if consistent with a specific plan for which an EIR was prepared, and consistent with the use, intensity, and policies of an SCS or Alternative Planning Strategy that is certified by the CARB as meeting its greenhouse gas reduction targets. A city or county may designate an "infill opportunity zone" by resolution if it is consistent with the general plan and any applicable specific plan and is a transit priority area within the adopted SCS or Alternative Planning Strategy. This infill opportunity zone is then exempt from level of service standards in the congestion management plan.

State Open Space Standards

State planning law (Government Code Section 65560) provides a structure for the preservation of open space by requiring every city and county in the State to prepare, adopt, and submit to the Secretary of the Resources Agency a "local open-space plan for the comprehensive and long-range preservation and conservation of open-space land within its jurisdiction." The following open space categories are identified for preservation:

- **Open space for public health and safety,** including, but not limited to, areas that require special management or regulation because of hazardous or special conditions;
- **Open space for the preservation of natural resources,** including, but not limited to, natural vegetation, fish and wildlife, and water resources;
- **Open space for resource management and production,** including, but not limited to, agricultural and mineral resources, forests, rangeland, and areas required for the recharge of groundwater basins;

- **Open space for outdoor recreation,** including, but not limited to, parks and recreational facilities, areas that serve as links between major recreation and open space reservations (such as trails, easements, and scenic roadways), and areas of outstanding scenic and cultural value; and
- **Open space for the protection of Native American sites,** including, but not limited to, places, features, and objects of historical, cultural, or sacred significance, such as Native American sanctified cemeteries, places of worship, religious or ceremonial sites, or sacred shrines located on public property (further defined in PRC Sections 5097.9 and 5097.993).

b. Regional and Local Laws, Regulations, and Policies

The following section focuses on the key plans that regulate land use in the SJCOG region, which consist of county and city general plans. This section outlines the status of those plans.

San Joaquin County General Plan 2035

San Joaquin County General Plan 2035 has land use regulatory authority over all unincorporated land in the County. Significant population and employment growth is expected to occur within the County over the time frame of the General Plan (i.e., 2035), and where this growth is planned will have an impact on many aspects of the County including agriculture, unincorporated communities, and employment opportunities. Shifting away from current development patterns in the Central Valley will require development to take on new forms that make more efficient use of existing infrastructure, reduce pollution, support public transit and other modes of active transportation, and preserve agricultural and open space lands.

City of Escalon General Plan

The City of Escalon's General Plan update was adopted in 2005. It consists of significant changes and updates to the General Plan adopted in 1994. In particular, the Land Use Element of the General Plan emphasizes the role of downtown as a focal point for the community. Furthermore, it states that development in the community should be compact and contiguous to existing developed areas (City of Escalon 2005).

City of Lathrop General Plan

The City of Lathrop's General Plan, adopted in 1991 and last amended in November 2004. Land Use is separated into three distinct categories. Sub-Plan Area #1 (lands east of Interstate 5) lies north of an existing residential neighborhood. This is the proposed as the site of a large multi-family development. Sub-Plan Area #2 is comprised of a portion of west Lathrop, Central Lathrop, and extends north to Interstate 5. Priorities for this area include commercial development, primarily comprised of freeway commercial uses. Sub-Plan Area #3 is designated for employment center use for a variety of businesses. It also envisions orienting the waterways that define the delta environment (City of Lathrop 2004).

City of Lodi General Plan

The 2010 General Plan is the City of Lodi's guiding document for growth and prosperity in the City. Outlining goals, policies, and implementation measures in a fashion complimenting the City's core values and providing direction for services provided by all departments. The General Plan contains

the following elements; safety, growth management and infrastructure, parks & recreation/open space, land use, community design and livability, transportation, conservation (City of Lodi 2010).

City of Manteca General Plan

The City of Manteca is in the process of updating its current General Plan of March 2021. Currently, the General Plan aims to provide a mix and distribution of uses that meet the identified needs of the community. Specific to the Land Use Element are the general distribution, location, and extent of the uses of land for housing, business, industry, education, public buildings and grounds, waste disposal, and open space (City of Manteca 2021).

City of Ripon General Plan

The City of Ripon is currently in the process of updating its General Plan for 2040. However, current the General Plan's Land Use Chapter establishes land use, growth accommodation, community design goals, policies, and actions to give direction to development in Ripon; providing the central policy background on which to base all land use decision-making in the City. It is through the realization of the goals and carrying out of corresponding actions that the future land use patterns of Ripon will continue to be shaped (City of Ripon 2006).

City of Stockton General Plan

The City of Stockton's 2040 General Plan governs land use and physical development within the geographic area of the incorporated city limits. Envision Stockton 2040 General Plan's land use map aims to concentrate high-intensity mixed uses and high-density residential uses in the Downtown area and shrink the future footprint of the city by changing areas previously designated Village to Open Space/Agriculture. Along the waterfront, future uses would promote an environment to further boost the Downtown's vitality. Outside of the Downtown, industrial designations along major corridors would shift to the outer parts of the city to promote more walkable, bikeable, and connected commercial and mixed-use corridors (City of Stockton 2018).

City of Tracy General Plan

The City of Tracy's 2011 General Plan Land Use Element contains specific goals, objectives, policies, and actions to guide land use for both the City of Tracy and its surrounding planning area. It lists land use designations and emphasizes a balanced pattern of growth. The City's Growth Management Ordinance adopted in 1987, amended in 2000, was adopted to achieve a steady growth rate that allows for an adequate provision of public services and a balance of housing opportunities (City of Tracy 2011).

4.12.3 Impact Analysis

a. Methodology and Significance Thresholds

Appendix G of the State CEQA Guidelines identifies criteria for determining the proposed 2022 RTP/SCS would have a significant impact on land use, namely whether or not the 2022 RTP/SCS would

1. Physically divide an established community; and/or
2. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation (including, but not limited to, the General Plan, or Zoning Ordinance) and result in a

physical change to the environment not already addressed in the other resource chapters of this EIR.

The 2022 RTP/SCS was assessed to determine whether the transportation projects and SCS land use pattern and strategies could conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. This review focused on the process used by SJCOG to develop regional growth projections, the transportation network and programs, housing needs estimates, and the SCS land use strategies. This evaluation of land use assumes that construction and development under the 2022 RTP/SCS would adhere to applicable federal, State, and local regulations and would conform to appropriate standards in the industry, as relevant for individual projects. Land use impacts related to implementation of the 2022 RTP/SCS land use development pattern and transportation projects would be inherently operational in nature and the following analysis discusses effects of the proposed Plan following implementation.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts that may be associated with the projects contained within the 2022 RTP/SCS. Section 4.12.3(c) summarizes the impacts associated with capital improvement projects proposed in the 2022 RTP/SCS. Due to the programmatic nature of the 2022 RTP/SCS, a precise, project level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1:	Physically divide an established community

Impact LU-1 IMPLEMENTATION OF PROPOSED TRANSPORTATION IMPROVEMENTS AND THE LAND USE SCENARIO ENVISIONED BY 2022 RTP/SCS WOULD NOT PHYSICALLY DIVIDE AN ESTABLISHED COMMUNITY. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

The 2022 RTP/SCS implements roadway projects and transportation improvements that will decrease traffic congestion, increase mobility, and improve alternative transportation infrastructure. Construction of additions to existing facilities and new facilities routinely involve temporary disruptions within established communities such as lane or road closures along roads and highways and service delays or detours for bus routes and passenger rail. Local jurisdictions routinely require traffic control plans and related measures to ensure that construction activities accommodate vehicular and pedestrian access, such as designating alternate routes or scheduling disruptive activities late at night or on weekends. With these controls, construction activities would not result in the physical division of established communities.

The 2022 RTP/SCS is intended to improve the system for all modes of transit so vehicles and non-motorized transit can use the streets simultaneously and safely. As a result, while roads may be expanded and widened under the 2022 RTP/SCS, these and/or other planned projects would include improvements to bicycle and pedestrian facilities. Because the existing roads subject to expansion or widening are already part of the communities in which they are located, such projects would not have the potential to divide those communities. The projects are intended to achieve goals of the 2022 RTP/SCS to increased mobility, reduce congestion, and decrease GHG; therefore, the projects should result in bringing communities closer together rather than dividing them. New road, highway interchanges, bicycle lanes and ADA accessibility projects included in the 2022 RTP/SCS

transportation system are long-planned projects that are typically included in local circulation elements. As such, they have been anticipated and accommodated in local land use planning and would be integrated into the community infrastructure. These projects would increase community connectivity and mobility and decrease congestion and GHG emissions.

The existing and new road projects contained in the 2022 RTP/SCS originate from either local circulation plans or state projects supported by cities and counties. The projects have therefore been coordinated with and integrated into local plans that support and connect communities consistent with state planning law.

The land use scenario envisioned by the 2022 RTP/SCS would encourage infill, mixed use, and transit-oriented development within existing urbanized areas. The land use scenario accommodates the people, households, and jobs identified in the regional growth forecast, and prioritizes future growth within existing communities. This type of development would not divide a community; rather it would promote the development of existing vacant or underutilized properties. This would locate people closer to existing employment and goods and services within established communities. Buildout of the SCS land use scenario would result in more compact development in those established communities. Buildout of the SCS land use scenario could result in some outlying development that would not divide communities.

Implementation of the 2022 RTP/SCS land use strategies would integrate future development into existing communities along the existing transportation network and would therefore not physically divide established communities. Many proposed transportation projects, such as expansion of transit services or the building of active transportation infrastructure, are intended to improve mobility and accessibility and may, as a result, improve community connectivity. Impacts related to dividing an established community would therefore be less than significant.

Mitigation Measures

No mitigation measures are required.

Threshold 2:	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 and result in a physical change to the environment not already addressed in the other resource chapters of this EIR.

Impact LU-2 2022 RTP/SCS PROJECT IMPLEMENTATION WOULD NOT CAUSE A SIGNIFICANT ENVIRONMENTAL IMPACT DUE TO A CONFLICT WITH ANY LAND USE PLAN, POLICY, OR REGULATION AND RESULT IN A PHYSICAL CHANGE TO THE ENVIRONMENT. THEREFORE, THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

In planning for projected growth in the region, the 2022 RTP/SCS represents a voluntary growth strategy that retains local government land use autonomy. Neither SB 375 nor any other law requires local member agency general plans or land use regulation to implement the land use policies in the 2045 MTP/SCS. Thus, implementation of the 2022 RTP/SCS is dependent on local government policy decisions and voluntary action. The proposed 2022 RTP/SCS includes a list of planned and programmed projects including local and regional capital improvements that have been anticipated or accounted for in local general plans. These plans are summarized above in Section 4.12.2 *Regulatory Setting.*

The land use scenario envisioned in the 2022 RTP/SCS is built on a set of integrated policies, strategies, and investments to maintain and enhance the transportation system to meet the diverse

needs of the region. The 2022 RTP/SCS encourages a multimodal transportation network, improvements to existing roads, an emphasis on non-motorized transportation and land use patterns to reduce the distance between trip destinations.

The 2022 RTP/SCS will help the region reach its GHG emission reduction targets established by the California Air Resource Board (CARB) from passenger vehicles and light trucks in 2020 and 2035 (see Section 4.8, *Greenhouse Gas Emissions/Climate Change*) under SB 375. Furthermore, the 2022 RTP/SCS encourages infill and TOD development to reduce automobile traffic and commute trip lengths. 2022 RTP/SCS projects encourage a multi-modal transportation network in high quality transit areas, roadway improvements, widening existing highways to relieve traffic congestion, and land use patterns to reduce distance between trip destinations. This approach is consistent with the general provisions of the FAST Act, and the Caltrans Smart Mobility 2010 framework.

At the local level, 2022 RTP/SCS builds on and incorporates regional and local planning efforts of its member agencies, including local general plans. Other key regional and local examples include, but are not limited to:

- Bicycle, Pedestrian, and Safe Routes to School Master Plan,
- Stockton Mobility Collective,
- Altamont Corridor Express,
- Ripon Blossom Express.

The land use scenario envisioned in the 2022 RTP/SCS was developed in close coordination with SJCOG member agency planning staff, the LAFCO within San Joaquin County, and the seven incorporated cities that comprise the SJCOG region. The envisioned land use scenario would build on the current local general plans of jurisdictions within the SJCOG region. This involved close coordination with SJCOG planning staff to discuss the land use pattern including methodology, assumptions, growth projections, place types, opportunity areas, economic development, and the transportation network included in the 2022 RTP/SCS. While cities and counties are not required by SB 375 to make their plans consistent with the RTP/SCS, every effort was made to avoid inconsistencies.

The 2022 RTP/SCS was assessed to determine whether the SCS land use pattern and strategies could conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. This review focused on the process used by SJCOG to develop regional growth projections, the transportation network and programs, housing needs estimates, and the SCS land use strategies. The SCS land use and transportation projects envisioned within the 2022 RTP/SCS would result in conflicts with land use plans, policies, or regulations. However, the 2022 RTP/SCS would not result in a physical change to the environment that has not already been addressed in the other resource chapters of this EIR. The impacts of any such conflicts are described throughout those sections of the EIR.

Mitigation Measures

Mitigation measures are provided for applicable resources throughout their respective environmental issue area sections of the EIR to reduce impacts. No additional mitigation is required for this impact because it would be less than significant.

c. Specific RTP Projects That May Result in Impacts

All proposed transportation projects listed in in Section 2, *Project Description*, would associate with Impacts LU-1 and LU-2.

4.12.4 Cumulative Impacts

Intensified development of cities in the SJCOG region could influence land uses in adjoining counties. Accordingly, the cumulative impact analysis area for land use and planning consists of the SJCOG region and adjoining counties. Information regarding these adjoining counties can be found in Section 3.1 – *Environmental Setting,* Table 3-1. Future development in this region that could divide an established community or conflict with any major land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect is considered in the analysis. This cumulative extent is used to evaluate potential impacts from the combined growth in this region.

The SJCOG region shares a border with six counties: Alameda, Stanislaus, Contra Costa, Sacramento, Amador, and Calaveras. Each of the six neighboring counties have adopted general plans that direct new growth to existing developed areas, strongly support the preservation of open space, and are part of other regional transportation plans. These general plans include goals, policies and programs adopted for the purpose of avoiding or mitigating environmental effects. All six counties have zoning ordinances. Since the geographic reach of 2022 RTP/SCS does not extend into these counties, and the goals, policies, programs and regulations adopted by the six adjacent counties are geographically limited to each of those counties, the potential for cumulative considerable conflict between the subject goals, policies, programs and regulations of these counties with the 2022 RTP/SCS and the SJCOG region is minimal. Therefore, the cumulative impacts resulting from the implementation of 2022 RTP/SCS related to conflict with plans, policies and regulations would be less than significant.

Implementation of the 2022 RTP/SCS would concentrate development in infill areas and as such, would not result in the division of established communities. Transportation projects and the land use scenario envisioned by 2022 RTP/SCS would occur along existing transportation corridors in urbanized areas. Therefore, cumulative impacts related to physically dividing an established community would be less than significant. The contribution of the 2022 RTP/SCS to this impact would not be cumulatively considerable.

Each of six adjacent counties has adopted general plans that direct new growth to existing developed areas, support agricultural land preservation, and are part of other regional RTP/SCSs. These general plans include goals, policies and programs adopted for the purpose of avoiding or mitigating environmental effects. Development under the existing plans would, therefore, be required to comply with all existing goals, policies, and programs within existing plans. Cumulative impacts would be less than significant.

Implementation of the proposed 2022 RTP/SCS would result in significant and unavoidable impacts in several environmental issue areas, as outlined in Sections 4.1 through 4.16 of this EIR. The transportation projects and envisioned land use scenario would not result in additional impacts beyond the findings of significant and unavoidable impacts already analyzed in respective environmental issue area sections within this EIR and would not result in a physical change to the environment that has not already been addressed in this EIR. Implementation of mitigation as listed throughout resource chapters of this EIR would reduce impacts of the proposed 2022 RTP/SCS.

Implementation of the proposed 2022 RTP/SCS would not result in a cumulatively considerable contribution to a significant cumulative impact.

4.13 Noise

This section evaluates potential noise and vibration impacts from development facilitated by the proposed 2022 RTP/SCS.

4.13.1 Setting

a. Overview of Noise and Vibration

The following discussion describes the characteristics of noise and vibration. These characteristics are used to assess potential impacts at sensitive land uses. Noise- and vibration-sensitive land uses include locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, senior facilities, schools, hospitals, guest lodging, libraries and some passive recreation areas are examples of typical noise- and vibration-sensitive land uses.

Noise

Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (California Department of Transportation [Caltrans] 2013a).

Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response, which is most sensitive to frequencies around 4,000 Hertz and less sensitive to frequencies around and below 100 Hertz (Kinsler, et. al. 1999). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used to measure earthquake magnitudes. A doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dBA; reducing the energy in half would result in a 3 dBA decrease (Crocker 2007).

Human perception of noise has no simple correlation with sound energy: the perception of sound is not linear in terms of dBA or in terms of sound energy. Two sources do not “sound twice as loud” as one source. It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA, increase or decrease (i.e., twice the sound energy); that a change of 5 dBA is readily perceptible (8 times the sound energy); and that an increase (or decrease) of 10 dBA sounds twice (half) as loud ([10.5x the sound energy] Crocker 2007).

Sound changes in both level and frequency spectrum as it travels from the source to the receiver. The most obvious change is the decrease in level as the distance from the source increases. The manner in which noise reduces with distance depends on factors such as the type of sources (e.g., point or line, the path the sound will travel, site conditions, and obstructions). Noise levels from a point source typically attenuate, or drop off, at a rate of 6 dBA per doubling of distance (e.g., construction, industrial machinery, ventilation units). Noise from a line source (e.g., roadway, pipeline, railroad) typically attenuates at about 3 dBA per doubling of distance (Caltrans 2013a). The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site, such as a parking lot or smooth body of water, receives no additional ground attenuation and the changes in noise levels with distance (drop-off rate) result from simply the geometric spreading

of the source. An additional ground attenuation value of 1.5 dBA per doubling of distance applies to a soft site (e.g., soft dirt, grass, or scattered bushes and trees) (Caltrans 2013a). Noise levels may also be reduced by intervening structures; the amount of attenuation provided by this "shielding" depends on the size of the object and the frequencies of the noise levels. Natural terrain features such as hills and dense woods, and man-made features such as buildings and walls, can significantly alter noise levels. Generally, any large structure blocking the line of sight will provide at least a 5-dBA reduction in source noise levels at the receiver (Federal Highway Administration [FHWA] 2011). Structures can substantially reduce exposure to noise as well. The FHWA's guidelines indicate that modern building construction generally provides an exterior-to-interior noise level reduction of 20 to 35 dBA with closed windows.

The impact of noise is not a function of loudness alone. The time of day when noise occurs, and the duration of the noise are also important factors of project noise impact. Most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors have been developed. One of the most frequently used noise metrics is the equivalent noise level (L_{eq}); it considers both duration and sound power level. L_{eq} is defined as the single steady A-weighted level equivalent to the same amount of energy as that contained in the actual fluctuating levels over time. Typically, L_{eq} is summed over a one-hour period. Lmax is the highest root mean square (RMS) sound pressure level within the sampling period, and Lmin is the lowest RMS sound pressure level within the measuring period (Crocker 2007).

Noise that occurs at night tends to be more disturbing than that occurring during the day. Community noise is usually measured using Day-Night Average Level (L_{dn}), which is the 24-hour average noise level with a +10 dBA penalty for noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours; it is also measured using Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a +5 dBA penalty for noise occurring from 7:00 p.m. to 10:00 p.m. and a +10 dBA penalty for noise occurring from 10:00 p.m. to 7:00 a.m. (Caltrans 2013a). Noise levels described by L_{dn} and CNEL usually differ by about 1 dBA. The relationship between the peak-hour L_{eq} value and the L_{dn}/CNEL depends on the distribution of traffic during the day, evening, and night. Quiet suburban areas typically have CNEL noise levels in the range of 40 to 50 dBA, while areas near arterial streets are in the 50 to 60-plus CNEL range. Normal conversational levels are in the 60 to 65-dBA L_{eq} range; ambient noise levels greater than 65 dBA L_{eq} can interrupt conversations (Federal Transit Administration [FTA] 2018).

Vibration

Groundborne vibration of concern in environmental analysis consists of the oscillatory waves that move from a source through the ground to adjacent structures. The number of cycles per second of oscillation makes up the vibration frequency, described in terms of Hz. The frequency of a vibrating object describes how rapidly it oscillates. The normal frequency range of most groundborne vibration that can be felt by the human body starts from a low frequency of less than 1 Hz and goes to a high of about 200 Hz (Crocker 2007).

While people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low frequency vibration. Vibration in buildings, such as from nearby construction activities, may cause windows, items on shelves, and pictures on walls to rattle. Vibration of building components can also take the form of an audible low frequency rumbling noise, referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hz), or when foundations or utilities, such as sewer and water pipes, physically connect the structure and the

vibration source (FTA 2018). Although groundborne vibration is sometimes noticeable in outdoor environments, it is almost never annoying to people who are outdoors. The primary concern from vibration is that it can be intrusive and annoying to building occupants and vibration-sensitive land uses.

Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source. High-frequency vibrations diminish much more rapidly than low frequencies, so low frequencies tend to dominate the spectrum at large distances from the source. Discontinuities in the soil strata can also cause diffractions or channeling effects that affect the propagation of vibration over long distances (Caltrans 2013b). When a building is impacted by vibration, a ground-to-foundation coupling loss will usually reduce the overall vibration level. However, under rare circumstances, the ground-to-foundation coupling may actually amplify the vibration level due to structural resonances of the floors and walls.

Vibration amplitudes are usually expressed in peak particle velocity (PPV) or RMS vibration velocity. The PPV and RMS velocity are normally described in inches per second. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring of blasting vibration because it is related to the stresses that are experienced by buildings (Caltrans 2013b).

b. Noise and Vibration Sources

The principal noise generators in the SJCOG region are associated with transportation (i.e., major roads, airports, and rail lines). Local collector streets are not typically significant noise sources as traffic volume and speeds are generally much lower than for freeways and arterial roadways.

Similar to the environmental setting for noise, the vibration environment is typically dominated by traffic from nearby roadways and activity on construction sites. Heavy trucks typically operate on major streets and can generate groundborne vibration that varies depending on vehicle type, weight, and pavement conditions. Nonetheless, vibration due to roadway traffic is typically not perceptible. The major noise and vibration sources in the region are described below.

Motor Vehicle Traffic

Motor vehicles, including cars/light trucks, buses, and various types of trucks, are the most substantial source of noise in most of the SJCOG region. This can be attributed to the extensive network of major, primary, and secondary arterials located throughout the region, as well as the large number of vehicle trips that occur each day.

The primary roadway corridor noise sources in the SJCOG region are Interstate 5 and State Route (SR) 99 due to the high traffic volumes and the high traffic speed of these roadways. In 2017, daily traffic on Interstate 5 averaged from 19,000 vehicles north of the Stanislaus-San Joaquin County line to 152,000 vehicles between the junction with SR 205 West and SR 120 East, west of the City of Manteca. In 2017, daily traffic on SR 99 averaged from 76,000 vehicles south of the Sacramento-San Joaquin County line to 116,000 vehicles between Milgeo Avenue and Jack Tone Road, near the southern County line (Caltrans 2017). As a result, noise levels along the entire Interstate 5 and SR 99 corridors in the region exceed 65 dBA CNEL. Levels of highway noise typically range from 70 to 80 dB(A) at a distance of 50 feet from highways (Federal Highway Administration [FHA] 2003).

Traffic on other major transportation corridors in the SJCOG region, such as SR 12, 26, 88, 120, and 132, and Interstate 205 and 580 also generates noise in excess of 65 dBA CNEL within certain

distances from the centerline of the freeway/roadway. Traffic on several roads in the region also generates noise in excess of normally acceptable standards for noise-sensitive uses.

Aircraft Operation

San Joaquin County has six public-use aviation airports, which include the following:

- Kingdon Executive
- Lodi
- Lodi Precissi Airpark
- New Jerusalem
- Stockton Metropolitan
- Tracy Municipal

Of these airports, only the Stockton Metropolitan Airport provides scheduled air carrier service. The Stockton Metropolitan Airport has commercial and general aviation activities. Because of the level of activity at this airport, noise generated is audible in the surrounding communities. Therefore, land uses in the surrounding areas have been planned to ensure that noise levels remain at acceptable levels for the various uses.

Stockton Metropolitan, Tracy Municipal, and New Jerusalem (outside Tracy) are all public airports while Lind's Airport, the Precissi Airpark, and the Kingdon Airpark are privately owned. While these general aviation airports do not generate as much noise as Stockton Metropolitan Airport, flight operations have also had impacts on the nearby residential areas because of their location.

In addition to airplanes, helicopter flights occur throughout the SJCOG region. These flights typically follow major and primary arterials with the exception of police patrol activities. Other flight-related activities include tourist sightseeing and San Joaquin County Sheriff's Department for search and rescue operations. San Joaquin General Hospital in San Joaquin is verified as a Level II Trauma Center and provides helicopter emergency medical services from Oakland to Rancho Murrieta. Although single-event noise exposure resulting from helicopter operations may be considered a nuisance, the relatively low frequency and short duration of these operations do not significantly affect average daily noise levels anywhere in the SJCOG region.

Railroad Operations

Train operations on the Altamont Corridor Express (ACE) and Amtrak generate noise within proximity to the railroad lines. Noise is generated during rail operations by locomotives starting and stopping, trains braking, the connection and disconnection of cars, train whistles, and track noise (the trains' wheels running on the track). The ACE commuter rail connects Stockton to San Jose. Amtrak originates in the City of Bakersfield and travels north towards Stockton.

The Amtrak San Joaquin is a passenger train. Twelve daily trains run between Bakersfield and Stockton, where the route splits to Oakland (four trains each way) or Sacramento (two trains each way). In the southern part of the County, train tracks are generally located much closer to residences.

Railroad operations generate high, relatively brief, intermittent noise events. These noise events are an environmental concern for sensitive uses located along rail lines and near sidings and switching yards. According to the FTA Transit Noise and Vibration Impact Assessment guidance document (2018), vehicle propulsion rail units generate the following noises: (1) whine from electric control

systems and traction motors that propel rapid transit cars, (2) diesel-engine exhaust noise from locomotives, (3) air-turbulence noise generated by cooling fans and (4) gear noise. Additional noise of motion is generated by the interaction of wheels/tires with their running surfaces. The interaction of steel wheels and rails generates three types of noise: (1) rolling noise due to continuous rolling contact, (2) impact noise when a wheel encounters a discontinuity in the running surface, such as a rail joint, turnout or crossover and (3) squeal generated by friction on tight curves.

When comparing electric- and diesel-powered trains, speed dependence is strong for electric-powered transit trains because wheel/rail noise dominates, and noise from this source increases strongly with increasing speed. On the other hand, speed dependence is less for diesel-powered commuter rail trains, particularly at low speeds where the locomotive exhaust noise dominates. As speed increases, wheel-rail noise becomes the dominant noise source and diesel- and electric-powered trains will generate similar noise levels. For transit vehicles in motion, close-by sound levels also depend upon other parameters, such as vehicle acceleration and vehicle length, plus the type/condition of the running surfaces. For very high-speed rail vehicles, air turbulence can also be a significant source of noise. In addition, the guideway structure can also radiate noise as it vibrates in response to the dynamic loading of the moving vehicle.

Rail operations generate varying noise levels depending on the type of rail activity. Heavier commuter or freight trains, which are diesel-powered, generate more noise than electrically-powered light-rail vehicles. According to the FTA, six commuter trains traveling at 50 miles per hour with a horn blowing generate a noise level of 81 dBA L_{eq} at 50 feet. This same activity without a horn generates a noise level of 68 dBA L_{eq} at 50 feet. In comparison, 12 light rail transit trains traveling 40 miles per hour generate a noise level of 65 dBA L_{eq} at 50 feet. These same light rail transit trains generate a noise level of 57 dBA L_{eq} at 20 miles per hour at 50 feet (FTA 2018).

Industrial and Manufacturing

Noise from industrial complexes and manufacturing plants are characterized as stationary or point sources even though they may include mobile sources like heavy equipment. Local governments typically regulate noise from industrial, manufacturing and construction equipment and activities through enforcement of noise ordinance standards, implementation of general plan policies and imposition of conditions of approval for building or grading permits.

In general, in the SJCOG region and throughout California, industrial complexes and manufacturing plants are located away from sensitive land uses and, as such, noise generated from these sources has less of an effect on surrounding properties.

Construction Noise and Vibration

Noise and vibration from construction sites are characterized as stationary or point sources even though heavy construction equipment is often mobile. Construction activities typically generate high, intermittent noise and vibration on and adjacent to construction sites and related noise and vibration impacts are short-term, occurring primarily on weekdays and during daylight hours. The dominant source of noise from most construction equipment is their diesel engine. During pile driving or pavement breaking events, impact noise is the dominant source and equipment produces the highest vibration levels. Construction equipment operates in two modes, stationary and mobile. Stationary equipment operates in one location for one or more days at a time and can generate a constant noise level (e.g., pumps, generators, and air compressors) or variable noise levels (e.g., pile drivers and pavement breakers). Mobile equipment moves around the construction site (e.g.,

dozers, tractors). Noise levels vary depending on the power cycle being used. Mobile equipment such as trucks, move to and from the site using adjacent streets/roads.

4.13.2 Regulatory Setting

a. Federal Laws, Regulations, and Policies

Relevant federal regulations include those established by the FHWA, FTA, Federal Aviation Administration (FAA), and Department of Housing and Urban Development (HUD).

Federal Highway Administration

Title 23, Part 772 of the Code of Federal Regulations - Traffic Noise

Traffic noise impacts, as defined in 23 CFR § 772.5, occur when the predicted noise level in the design year approach or exceed the noise abatement criteria (NAC) specified in 23 CFR § 772, or a predicted noise level substantially exceeds the existing noise level (a "substantial" noise increase). A "substantial increase" is defined as an increase of 12 dB L_{eq} during the peak hour of traffic. For sensitive uses, such as residences, schools, churches, parks, and playgrounds, the NAC for interior and exterior spaces is 57 dB L_{eq} and 66 dB L_{eq}, respectively, during the peak hour of traffic noise. Table 4.13-1 summarizes NAC corresponding to various land use activity categories. Activity categories and related traffic noise impacts are determined based on the actual land use in a given area.

Title 40, Part 205, Subpart B of the Code of Federal Regulations – Medium and Heavy Trucks

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR Part 205, Subpart B. The federal truck passby noise standard is 80 dB at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers. The FHWA regulations for noise abatement apply to federal or federally-funded projects involving the construction of a new highway or significant modification of an existing freeway when the project would result in a substantial noise increase or when the predicted noise levels approach or exceed the NAC.

Title 40, Part 201 and Title 49, Part 210 of the Code of Federal Regulations - Railroad Noise

Federal regulations for railroad noise are contained in 40 CFR Part 201 and 49 CFR Part 210. The regulations set noise limits for locomotives and are implemented through regulatory controls on locomotive manufacturers.

Table 4.13-1 Noise Abatement Criteria (NAC)

Activity Category	Hourly Leq	Hourly L10[1]	Analysis Location	Description of Activity Category
A	57	60	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67	70	Exterior	Residential
C	67	70	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52	55	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E	72	75	Exterior	Hotels, motels, offices, restaurants/bars and other developed lands, properties or activities not included in A-D or F
F				Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical) and warehousing
G				Undeveloped lands that are not permitted

[1] L10 is the level of noise exceeded for 10% of the time.

Source: FHWA 2017

Title 23, Part 772 of the Code of Federal Regulations – Federal and Federal-Aid Highway Projects

Title 23 of the Code of Federal Regulations (23 CFR § 772) provides procedures for preparing operational and construction noise studies and evaluating noise abatement for federal and federal-aid highway projects. Under 23 CFR § 772.5, projects are categorized as Type I, II, or III projects.

FHWA defines a Type I project as a proposed federal or federal-aid highway project for the construction of a highway on a new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment, or increases the number of through-traffic lanes. A Type II project is a noise barrier retrofit project that involves no changes to highway capacity or alignment.

Type I projects include those that create a completely new noise source, increase the volume or speed of traffic, or move the traffic closer to a receiver. Type I projects include the addition of an interchange, ramp, auxiliary lane, or truck-climbing lane to an existing highway, or the widening an existing ramp by a full lane width for its entire length. Projects unrelated to increased noise levels, such as striping, lighting, signing, and landscaping projects, are not considered Type I projects.

Under 23 CFR § 772.11, noise abatement must be considered for Type I projects if the project is predicted to result in a traffic noise impact. In such cases, 23 CFR § 772 requires that the project sponsor "consider" noise abatement before adoption of the environmental document. This process

involves identification of noise abatement measures that are reasonable, feasible and likely to be incorporated into the project as well as noise impacts for which no apparent solution is available.

Type III projects are Federal or Federal-aid highway projects that do not meet the classification of a Type I or Type II project. Noise analysis is not required for Type III projects. Projects unrelated to increased noise levels, such as striping, lighting, signing, and landscaping projects, are considered Type III projects.

Federal Aviation Administration

Title 14, Part 36 of the Code of Federal Regulations - Aircraft Noise

Aircraft operated in the U.S. are subject to federal requirements regarding noise emissions levels. These requirements are set forth in Title 14 CFR, Part 36. Part 36 establishes maximum acceptable noise levels for specific aircraft types, taking into account the model year, aircraft weight and number of engines.

Federal Transit Administration

The FTA has developed guidance to evaluate noise impacts from operation of surface transportation modes (i.e., passenger cars, trucks, buses, and rail) in the 2018 FTA *Transit Noise Impact and Vibration Assessment* (FTA 2018). All mass transit projects receiving federal funding must use these guidelines to predict and assess potential noise and vibration impacts. As ambient levels increase, smaller increments of change are allowed to minimize community annoyance related to transit operations.

Department of Housing and Urban Development

Title 24, Part 51, Subpart B of the Code of Federal Regulations – Noise Abatement and Control

The mission of HUD includes fostering "a decent, safe, and sanitary home and suitable living environment for every American." Accounting for acoustics is intrinsic to this mission as safety and comfort can be compromised by excessive noise. To facilitate the creation of suitable living environments, HUD has developed a standard for noise criteria. The basic foundation of the HUD noise program is set out in the noise regulation 24 CFR Part 51 Subpart B, Noise Abatement and Control.

HUD's noise policy requires noise attenuation measures be provided when proposed projects are to be located in high noise areas. Within the HUD Noise Assessment Guidelines, potential noise sources are examined for projects located within 15 miles of a military or civilian airport, 1,000 feet from a road or 3,000 feet from a railroad.

HUD exterior noise regulations state that 65 dBA L_{dn} noise levels or less are acceptable for residential land uses and noise levels exceeding 75 dBA L_{dn} are unacceptable. HUD's regulations do not contain standards for interior noise levels. The HUD regulations establish a goal of 45 decibels, and the attenuation requirements are focused on achieving that goal. The HUD guidelines assume that with standard construction methods and materials, any building will provide sufficient attenuation so that if the exterior level is 65 dBA L_{dn} or less, the interior level will be 45 dBA L_{dn} or less. Noise criteria are consistent with FHWA and related state requirements

b. State Laws, Regulations, and Policies

Land Use Compatibility Guidelines

The Governor's Office of Planning and Research is required to adopt and periodically revise guidelines for the preparation and content of local general plans. The 2017 General Plan Guidelines (Governor's Office of Planning and Research, 2017) establish land use compatibility guidelines. Where a noise level range is denoted as "normally acceptable" for the given land use, the highest noise level in that range should be considered the maximum desirable for conventional construction that does not incorporate any special acoustic treatment. The acceptability of noise environments classified as "conditionally acceptable" or "normally unacceptable" will also depend on the anticipated amount of time that will normally be spent outside the structure and the acoustic treatment to be incorporated in structural design.

With regard to noise-sensitive residential uses, the recommended exterior noise limits are 60 dBA CNEL for single-family residences and 65 dBA CNEL for multi-family residences. The recommended maximum interior noise level is 45 dBA CNEL, which could normally be achieved using standard construction techniques if exterior noise levels are within the levels described above.

California Department of Transportation

Caltrans establishes noise limits for vehicles licensed to operate on public roads (Caltrans 2013a). For heavy trucks, the State passby standard is consistent with the federal limit of 80 dB. The State pass-by standard for light trucks and passenger cars (less than 4.5 tons gross vehicle rating) is also 80 dB at 15 meters from the centerline. For new roadway projects, Caltrans uses the NAC discussed above in connection with FHWA. In addition, Caltrans has published the Traffic Noise Analysis Protocol (May 2011) for assessing noise levels associated with roadway projects (Caltrans 2020a).

Caltrans has a *Transportation and Construction Induced Vibration Manual* that provides general guidance on vibration issues associated with construction and operation of projects in relation to human perception and structural damage (Caltrans 2020b).

Section 216 of the California Streets and Highways Code relates to the noise effects of a proposed freeway project on public and private elementary and secondary schools. Under this code, a noise impact occurs if, as a result of a proposed freeway project, noise levels exceed 52 dBA Leq in the interior of public or private elementary or secondary classrooms, libraries, multipurpose rooms, or spaces. If a project results in a noise impact under this code, noise abatement must be provided to reduce classroom noise to a level that is at or below 52 dBA Leq. If the noise levels generated from roadway sources exceed 52 dBA Leq prior to the construction of the proposed freeway project, then noise abatement must be provided to reduce the noise to the level that existed prior to construction of the project.

California's Airport Noise Standards and Compatibility Planning

The State of California has the authority to establish regulations requiring airports to address aircraft noise impacts near airports. The State of California's Airport Noise Standards, found in Title 21 of the California Code of Regulations, identify a noise exposure level of 65 dB CNEL as the noise impact boundary around airports. Within the noise impact boundary, airport proprietors are required to ensure that all land uses are compatible with the aircraft noise environment, or the airport proprietor must secure a variance from Caltrans.

California Noise Insulation Standards

The California Noise Insulation Standards found in Title 24 of the California Code of Regulations set requirements for new multi-family residential units, hotels, and motels that may be subject to relatively high levels of transportation-related noise. For exterior noise, the noise insulation standard is 45 dBA L_{dn} in any habitable room and requires an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than 60 dBA L_{dn}.

California Aeronautics Act

The State Aeronautics Act (Public Utilities Code, Section 21670 et seq.) requires the establishment of Airport Land Use Commissions (ALUCs), which are responsible for developing airport land use compatibility plans (ALUCPs) for noise-compatible land uses in the immediate proximity of a commercial or public airport (Section 21675). ALUCs have two major roles: preparation and adoption of airport land use compatibility plans, which address policies for both noise and safety and review of certain local government land use actions and airport plans for consistency with the land use compatibility plan.

The ALUCP is the major tool for ALUC land use regulation. The intent of the ALUCP is to encourage compatibility between airports and the various land uses that surround them. ALUCPs typically include the development of noise contours to identify excessive airport-related noise levels and measures to reduce noise levels. For example, Monterey Regional Airport encourages noise abatement procedures related to quiet departure techniques.

The Aeronautics Division of Caltrans has published the *California Airport Land Use Planning Handbook* (Caltrans 2011). The purpose of the *California Airport Land Use Planning Handbook* is to provide guidance for conducting airport land use compatibility planning. This handbook includes a section related to noise and states, “The basic strategy for achieving noise compatibility in the vicinity of an airport is to prevent or limit development of land uses that are particularly sensitive to noise. Common land use strategies are ones that either involve few people (especially people engaged in noise-sensitive activities) or generate significant noise levels themselves (such as other transportation facilities or some industrial uses).”

Within the SJCOG region, SJCOG serves as the ALUC and is responsible for protecting public health, safety and welfare by ensuring that vacant lands in the vicinity of airports are planned and zoned for uses compatible with airport operations. The San Joaquin County Airport Land Use Plan was adopted in 1993 (SJCOG 1993).

c. Regional and Local Laws, Regulations, and Policies

To identify, appraise and remedy noise and vibration problems in local communities, San Joaquin County, and incorporated cities in the SJCOG region are each required to adopt a noise element as part of their General Plan. Local governments use the Governor’s Office of Planning and Research’s General Plan Guidelines (2017), including land use compatibility guidelines, to prepare General Plan noise elements.

Each noise element is required to analyze and quantify current and projected noise levels associated with local noise sources, including, but not limited to: highways and freeways, primary arterials and major local streets, rail operations, air traffic associated with the airports; local industrial plants; and other ground stationary sources that contribute to the community noise environment. Beyond statutory requirements, local jurisdictions are free to adopt their own goals and policies in their

noise elements, although most jurisdictions have chosen to adopt noise/land use compatibility guidelines that are similar to those recommended by the State. Land use compatibility considers both existing noise levels in a community, as well as community attitudes toward dominant noise sources.

In addition to regulating noise through noise element policies, local jurisdictions regulate noise through enforcement of local ordinance standards. These standards generally relate to noisy activities (e.g., use of loudspeakers and construction) and stationary noise sources and facilities (e.g., air conditioning units and industrial activities). The SJCOG region has seven incorporated cities, each of which has its own adopted noise standards. Noise standards for the County and the cities within the County typically apply land-use compatibility criteria of 65 dBA L_{dn} or less as being the normally acceptable range for new residential developments, and interior noise criteria of 45 dBA L_{dn}, consistent with the overall State recommendations.

As discussed above, the State Aeronautics Act (Public Utilities Code, Section 21670 et seq.) requires the preparation of an ALUCP for nearly all public-use airports in the State (Section 21675). An Airport Land Use Commission (ALUC) is responsible for preparing the ALUCPs and ensuring compatible land uses in the vicinity of airports within their jurisdiction (Section 21676).

4.13.3 Impact Analysis

a. Methodology and Significance Thresholds

The analysis of noise impacts considers the effects of both temporary construction-related noise and long-term noise associated with proposed transportation system improvements. Temporary construction noise was estimated based upon levels presented in the FTA Transit Noise and Vibration Impact Assessment.

Appendix G of the State CEQA Guidelines identifies the following criteria for determining whether development facilitated by the proposed 2022 RTP/SCS would have a significant noise or vibration impact. SJCOG has added a threshold related to absolute noise increases. Therefore, this analysis evaluates whether or not the 2022 RTP/SCS would:

1. Generate 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;
2. Generate a substantial absolute increase in ambient noise;
3. Generate excessive groundborne vibration or groundborne noise levels; or
4. For a project located within the vicinity of a private airstrip or 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.

Thresholds 1, 2, and 3 are discussed further in this section. Threshold 4 is discussed in Section 4.17, *Effects Considered Less Than Significant*.

San Joaquin County and the seven incorporated cities within the SJCOG region each have their own noise standards. These local noise standards typically apply land-use compatibility criteria of 60-65 dBA CNEL as the normally acceptable range for residential developments, and interior noise criteria

of 45 dBA CNEL, consistent with the overall State recommendations and the recommendations of HUD for residential uses.

The operational and construction noise limits used in this analysis are based on levels at which a substantial noise level increase would occur relative to ambient noise levels. Because these noise limits are tailored to specific uses (e.g., exterior and interior areas), they account for typical ambient noise levels associated with each use such that an increase in ambient noise levels that exceeds these limits would be considered a substantial increase above ambient noise levels. The analysis of potential impacts includes an assessment of all applicable standards, including those established by local jurisdictions, counties, the State of California, and federal agencies, where appropriate.

Since this document analyzes noise impacts on a program level only, project level analyses for various projects within the 2022 RTP/SCS will be necessary in the future.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with projects contained within the 2022 RTP/SCS. Section 4.13.3.c summarizes the impacts associated with capital improvement projects proposed in the 2022 RTP/SCS. Due to the programmatic nature of the 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1:	Generate 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
Threshold 2:	Generate a substantial absolute increase in ambient noise

Impact N-1 CONSTRUCTION ACTIVITY ASSOCIATED WITH PROPOSED TRANSPORTATION IMPROVEMENT PROJECTS AND OTHER LAND USE DEVELOPMENT ENVISIONED BY THE 2022 RTP/SCS WOULD GENERATE A SUBSTANTIAL TEMPORARY INCREASE IN AMBIENT NOISE LEVELS IN EXCESS OF STANDARDS ESTABLISHED IN LOCAL GENERAL PLANS OR NOISE ORDINANCES, AND WOULD GENERATE A SUBSTANTIAL ABSOLUTE NOISE INCREASE OVER EXISTING NOISE LEVELS. THIS IMPACT WOULD BE SIGNIFICANT AND UNAVOIDABLE.

The operation of equipment during the construction of roadway infrastructure, as well as land-use development envisioned in 2022 RTP/SCS would result in temporary increases in noise in the immediate vicinity of individual construction sites. As shown in Table 4.13-2, average noise levels associated with the use of heavy equipment at construction sites typically range from 76 to 88 dBA at 50 feet from the source, depending upon the types of equipment in operation at any given time and the phase of construction. For projects that require pile driving, construction noise levels may reach 101 dBA at 50 feet from the source. For projects that do not require pile driving, the highest noise levels typically occur during excavation and foundation development, which involves the use of such equipment as backhoes, bulldozers, pile drivers, and front-end loaders.

Table 4.13-2 Typical Noise Levels for Construction Equipment (dBA)

Equipment	Typical Level 25 feet from the Source	Typical Level 50 feet from the Source	Typical Level 100 feet from the Source
Air Compressor	86	80	74
Backhoe	86	80	74
Concrete Mixer	91	85	79
Dozer	91	85	79
Grader	91	85	79
Jack Hammer	94	88	82
Loader	86	80	74
Paver	91	85	79
Pile-drive (Impact)	107	101	95
Pile-driver (Sonic)	101	95	89
Roller	91	85	79
Saw	82	76	70
Scarified	89	83	77
Scraper	91	85	79
Truck	90	84	78

Source: FTA 2018

Noise generated by construction projects would vary depending on the project and intensity of equipment use. Roadway widening projects and new roadway projects would likely require the operation of multiple pieces of heavy-duty equipment that generate high noise levels. Alternatively, repainting/restriping projects typically requiring minimal use of heavy equipment. This conservative analysis assesses construction noise based on the operation of heavy-duty equipment. Noise levels from point sources such as individual construction sites typically attenuate at a rate of 6 dBA per doubling of distance. Therefore, areas within 800 feet of a construction site with heavy-duty equipment may be exposed to noise levels exceeding 65 dBA. Areas within 3,200 feet of impact pile drivers may be exposed to noise levels exceeding 65 dBA.

Some local agencies in the SJCOG region include specific regulations in their municipal code to reduce construction noise impacts. In most cases, these regulations restrict construction activities to specific times and days. Such local policies serve to reduce the impacts of noise on surrounding communities by prohibiting construction during the night when people are engaged in noise-sensitive activities like sleeping. Nevertheless, this impact is significant because applicable noise standards would be exceeded, or because a substantial temporary increase in ambient noise levels in the project vicinity would occur.

Mitigation Measure

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measure developed for the 2022 RTP/SCS program where applicable for transportation projects that would result in noise impacts, and where feasible and necessary based on project and site-specific considerations. San Joaquin County and incorporated cities in the County can and should implement this measure

where relevant to land use projects implementing 2022 RTP/SCS. Project-specific environmental documents may adjust this measure as necessary to respond to site-specific conditions.

N-1 Construction Noise Reduction

To reduce construction noise levels to achieve applicable standards, implementing agencies for transportation and land use projects shall implement the measures identified below where feasible and necessary.

a. **Compliance with local Construction Noise Regulations.** Implementing agencies shall ensure that, where residences or other noise sensitive uses are located within 800 feet of construction sites without pile driving, appropriate measures shall be implemented to ensure consistency with local noise ordinance requirements relating to construction. Specific techniques may include, but are not limited to, restrictions on construction timing, use of sound blankets on construction equipment, and the use of temporary walls and noise barriers to block and deflect noise.

b. **Noise Complaint and Enforcement Manager.** Designate an on-site construction complaint and enforcement manager for projects within 800 feet of sensitive receivers. Implementing agencies shall post phone numbers for the on-site enforcement manager at construction sites along with complaint procedures and who to notify in the event of a problem.

c. **Pile Driving**. For any project within 3,200 feet of sensitive receptors that requires pilings, the implementing agency shall require caisson drilling or sonic pile driving as opposed to pile driving, where feasible. This shall be accomplished through the placement of conditions on the project during its individual environmental review.

d. **Construction Equipment Noise Control**. Implementing agencies shall ensure that equipment and trucks used for project construction utilize the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds).

e. **Impact Equipment Noise Control.** Implementing agencies shall ensure that impact equipment (e.g., jack hammers, pavement breakers, and rock drills) used for project construction be hydraulically or electrically powered wherever feasible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatically powered tools is unavoidable, use of an exhaust muffler on the compressed air exhaust can lower noise levels from the exhaust by up to about 10 dBA. When feasible, external jackets on the impact equipment can achieve a reduction of 5 dBA. Whenever feasible, use quieter procedures, such as drilling rather than impact equipment operation.

f. **Construction Activity Timing Restrictions.** The following timing restrictions shall apply to 2022 RTP/SCS activates creating noise levels at or above 65 dBA at a nearby dwelling unit, except where timing restrictions are already established in local codes or policies. Construction activities shall be limited to:

   - Monday through Friday: 7 a.m. to 6 p.m.
   - Saturday: 9 a.m. to 5 p.m.

g. **Placement of Stationary Noise Sources.** Locate stationary noise sources as far from noise-sensitive receptors as possible. Stationary noise sources that must be located near existing receptors will be equipped with the best available mufflers.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are San Joaquin County and incorporated cities within the County. This mitigation measure shall, or can and should, be applied during project permitting and environmental review and implemented during construction, as applicable.

Significance After Mitigation

Mitigation Measure N-1 would reduce construction noise impacts to the extent feasible. However, even with application of Mitigation Measure N-1 construction noise from all 2022 RTP/SCS projects may not be reduced below applicable thresholds and impacts would remain significant and unavoidable. No additional mitigation measures to reduce this impact to less than significant levels are feasible.

Threshold 1:	Generate 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
Threshold 2:	Generate a substantial absolute increase in ambient noise

Impact N-2 PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE 2022 RTP/SCS WOULD GENERATE A SUBSTANTIAL PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN EXCESS OF STANDARDS OR OVER EXISTING NOISE LEVELS AND GENERATE A SUBSTANTIAL ABSOLUTE NOISE INCREASE OVER EXISTING NOISE LEVELS. THIS IMPACT WOULD BE SIGNIFICANT AND UNAVOIDABLE.

Traffic

Overall traffic levels on highways and roadways in the SJCOG region are projected to increase as a result of regional growth through the year 2046 with or without implementation of the 2022 RTP/SCS (refer to Section 4.14, Transportation). It should be noted that while traffic may increase in certain locations, the expected number of reduced vehicle miles traveled (VMT) per weekday in 2046 would be 220,663 VMT in the RTP/SCS preferred scenario. In general, as the VMT decreases, noise associated with VMT would also decrease.

The 2022 RTP/SCS includes several projects that would potentially increase traffic noise by increasing traffic levels along and in the vicinity of affected facilities. Such projects include intersection improvements, addition of high occupancy vehicle (HOV) lanes on Interstate 5 and SR 99, widening existing roadways, widening ramps and bridge structures, interchange modifications, and road improvements that would allow increased traffic volumes. These projects would not introduce new traffic but rather are intended to relieve current or projected future traffic congestion or unacceptable safety conditions. However, in some cases, projects that expand roadway capacity would accommodate additional traffic volumes and/or relocate noise sources closer to sensitive receptors. Therefore, this impact is significant because applicable noise standards could be exceeded, or because a substantial permanent increase in ambient noise levels in the project vicinity would occur.

Airports

The 2022 RTP/SCS does not include any airport improvement projects or programs that would directly or indirectly increase aircraft operations at operating airports in the SJCOG region. Therefore, 2022 RTP/SCS would not increase ambient noise levels associated with airports. No impacts due to aircraft operations would occur.

Rail Operations

The 2022 RTP/SCS includes investments in passenger rail and train service, such as the construction of new double main tracks, construction of track connections, grade separations, right of way improvements, extension of existing services at various facilities, and maintenance activities at various facilities. The FTA has developed a screening procedure to identify locations where a rail project may cause a noise impact. The screening distances for requiring noise assessments for various types of projects are presented in Table 4.13-3.

Table 4.13-3 Screening Distances for Noise Assessments – Rail Transit Projects

		Screening Distance (Feet)	
Type of Project		**Unobstructed**	**Intervening Buildings**
Commuter Rail Mainline		750	375
Commuter Rail Station	With Horn Blowing	1,600	1,200
	Without Horn Blowing	250	200
Commuter Rail -Highway Crossing with Horns and Bells		1,600	1,200
Light Rail Transit		350	175
Street car		200	100
Access Roads		100	50
Low- and Intermediate-Capacity Transit	Steel Wheel	125	50
	Rubber Tire	90	40
	Monorail	175	70
Yards and Shops		1,000	650
Parking Facilities		125	75
Access Roads to Parking		100	50
Ventilation Shafts		200	100
Power Substations		250	125

Source: FTA 2018

Rail transit projects included in the 2022 RTP/SCS would be located in urban areas near to facility ridership. Sensitive land uses would be located within proximity to new and expanded rail corridors and would potentially be exposed to noise levels that exceed acceptable standards.

Bus Operations

The 2022 RTP/SCS includes projects to improve existing bus service, such as improvements at existing transit centers, purchasing of replacement buses, fleet maintenance, bus stop/shelter replacement/improvements, solar charging facilities for electric buses, and construction of a new bus maintenance and storage facility, which could indirectly increase bus operations. The FTA has

developed a screening procedure to identify locations where a bus project may cause a noise impact. The screening distances for requiring noise assessments for various types of projects are presented in Table 4.13-4.

Table 4.13-4 Screening Distances for Noise Assessments – Bus Transit Projects

Type of Project		Screening Distance (Feet)	
		Unobstructed	Intervening Buildings
Busway		500	250
BRT on Exclusive Roadway		200	100
Bus Facilities	Access Roads	100	50
	Transit Center	225	150
	Storage and Maintenance	350	225
	Park and Ride Lots with Buses	225	150

Source: FTA 2018

Increase frequency of bus operations along existing corridors would increase noise for existing sensitive receptors along bus routes. However, the addition of local buses is unlikely to increase noise by significant levels as bus routes would be in urban areas with high ambient noise levels. Overall, sensitive land uses would be located within close proximity to new bus activity and would potentially be exposed to noise levels that exceed acceptable standards. Overall, ambient noise levels will increase in excess of standards or over existing noise levels generating a substantial absolute noise increase over existing noise levels. This impact will be significant and unavoidable.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measure developed for the 2022 RTP/SCS program where applicable for transportation projects that would result in traffic noise impacts, and where feasible and necessary based on project and site-specific considerations. San Joaquin County and incorporated cities in the County can and should implement this measure where relevant to land use projects implementing 2022 RTP/SCS. Project-specific environmental documents may adjust this measure as necessary to respond to site-specific conditions.

N-2 Noise Assessment and Control for Mobile and Point Source Reduction

Implementing agencies shall complete detailed noise assessments using applicable guidelines (e.g., Caltrans Traffic Noise Analysis Protocol) for roadway and rail projects that may impact noise sensitive receptors. The implementing agency shall ensure that a noise survey is conducted that, at minimum:

- Determines existing and projected noise levels
- Determines the amount of attenuation needed to reduce potential noise impacts to applicable State and local standards
- Identifies potential alternate alignments that allow greater distance from, or greater buffering of, noise-sensitive areas

- If warranted, recommends methods for mitigating noise impacts, including:
  - Appropriate setbacks
  - Sound attenuating building design, including retrofit of existing structures with sound attenuating building materials
  - Use of sound barriers (earthen berms, sound walls, or some combination of the two)
  - Locate transit-related passenger stations, central maintenance facilities, decentralized maintenance facilities, and electric substations away from sensitive receptors to the maximum extent feasible

Where new or expanded roadways or transit are found to expose receptors to noise exceeding normally acceptable levels, the individual project lead agency shall implement techniques as recommended in the project-specific noise assessments. The preferred methods for mitigating noise impacts will be the use of appropriate setbacks and sound attenuating building design, including retrofit of existing structures with sound attenuating building materials where feasible. In instances where use of these techniques is not feasible, the use of sound barriers (earthen berms, sound walls, or some combination of the two) will be considered. Long expanses of walls or fences should be interrupted with offsets and provided with accents to prevent monotony. Landscape pockets and pedestrian access through walls should be provided. Whenever possible, a combination of elements shall be used, including open grade paving, solid fences, walls, and landscaped berms. Other techniques such as rubberized asphalt or "quiet pavement" can be used where feasible to reduce road noise for new roadway segments or modifications requiring repaving. The effectiveness of noise reduction measures shall be monitored by taking noise measurements and installing adaptive mitigation measures to achieve applicable standards.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are San Joaquin County and incorporated cities within the County. This mitigation measure shall, or can and should, be applied during project permitting and environmental review and implemented during construction, as applicable.

Significance After Mitigation

Implementation of Mitigation Measure N-2 would reduce noise from mobile sources. However, even with implementation of this mitigation measure, mobile source noise from buildout of the 2022 RTP/SCS may continue to exceed acceptable standards. No additional mitigation measures to reduce this impact to less than significant levels are feasible. Therefore, this impact would remain significant and unavoidable.

Threshold 3: Generate excessive groundborne vibration or groundborne noise levels

Impact N-3 CONSTRUCTION ACTIVITIES ASSOCIATED WITH TRANSPORTATION PROJECTS AND LAND USE PROJECTS WOULD GENERATE EXCESSIVE GROUNDBORNE VIBRATION LEVELS. NEW TRUCK AND BUS TRAFFIC RESULTING FROM THE 2022 RTP/SCS WOULD GENERATE EXCESSIVE VIBRATION LEVELS. THESE IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.

Construction

Construction-related vibration has the potential to damage structures, cause cosmetic damage (e.g., crack plaster), or disrupt the operation of vibration-sensitive equipment. Vibration can also be a source of annoyance to individuals who live or work close to vibration-generating activities. Heavy construction operations can cause substantial vibration near the source. Table 4.13-5 shows vibration levels associated with typical construction equipment. Similar to construction noise, vibration levels would be variable depending on the type of construction project and related equipment use.

Table 4.13-5 Vibration Source Levels for Construction Equipment

Equipment		Approximate Vibration Level (VdB)			
		25 feet from Source	50 feet from Source	100 feet from Source	200 feet from Source
Caisson Drilling		87	78	69	60
Jackhammer		79	70	61	52
Large Bulldozer		87	78	69	60
Loaded Truck		86	77	68	58
Pile Driver (impact)	Upper range	112	103	94	84
	Typical	104	95	86	77
Pile Driver (sonic)	Upper range	105	96	87	78
	Typical	93	84	75	65
Small Bulldozer		58	48	39	30
Vibratory Roller		94	85	76	67

Source: FTA 2018

Typical project construction activities, such as the use of jackhammers, other high-power or vibratory tools, compactors, and tracked equipment, may also generate substantial vibration (i.e., greater than 0.2 inches per second PPV) in the immediate vicinity, typically within 15 feet of the equipment. Through the use of scheduling controls, typical construction activities would be restricted to hours with least potential to affect nearby properties. Thus, perceptible vibration can be kept to a minimum and not result in human annoyance or structural damage.

Some specific construction activities result in higher levels of vibration. Pile driving has the potential to generate the highest vibration levels and is the primary concern for structural damage to nearby structures, especially when near fragile and/or historic structures. Vibration levels generated by pile driving activities would vary depending on project conditions, such as soil conditions, construction methods and equipment used. Depending on the proximity of existing structures to each construction site, the structural soundness of the affected buildings and construction methods, vibration caused by pile driving or other foundation work with a substantial impact component such

as blasting, rock or caisson drilling, and site excavation or compaction may be high enough to be perceptible outside the construction area and potentially damage existing structures.

San Joaquin County and some of the incorporated cities in the SJCOG region include regulations in their municipal code that reduce construction noise and vibration impacts. In most cases, these regulations restrict vibration-generating construction activities to specific times and days. Such local policies reduce the impacts of vibration on surrounding communities by prohibiting construction during the night when people are engaged in vibration-sensitive activities like sleeping. Nevertheless, this impact is significant because transportation or land use project construction would cause excessive groundborne vibration or groundborne noise levels.

Operation

The primary vibration sources associated with transportation system operations include heavy truck and bus traffic along roadways and train traffic along rail lines. However, vehicle traffic, including heavy trucks traveling on a highway, rarely generate vibration amplitudes high enough to cause structural or cosmetic damage, except in rare cases (e.g., where heavy truck traffic passes near fragile older buildings). Heavy trucks traveling over potholes or other pavement irregularities can cause vibration high enough to result in complaints from nearby residents. These conditions are commonly addressed by smoothing the roadway surface. Based on vibration measurements throughout California by Caltrans, worst-case traffic vibrations were shown to drop below the threshold of perception at distances of 150 feet or greater (Caltrans 2013). Given that sensitive receptors are located within 150 feet of transportation facilities within the SJCOG region, and that 2022 RTP/SCS transportation projects include roadway expansion and construction of high occupancy vehicle lanes on Interstate 5, SR 99, or other highways, significant impacts related to vibration associated with truck traffic could occur.

Rail activity is also a source of vibration. Caltrans conducted measurements of vibration levels associated with train activity throughout the State and found a peak vibration level of 0.36 inches per second PPV at ten feet from the track (Caltrans 2004). Based on this reference vibration level, vibrations from train activity drop below the threshold of perception at distances greater than 250 feet. The 2022 RTP/SCS includes additional train maintenance facilities (SJ07-6017), implementation and support of one additional commuter train by 2022 and a second by 2030 (SJ07-6018), improved rail information systems (SJ07-6019), safety upgrades (SJ07-6023), lengthening the platform at the current Lathrop/Manteca Station (SJ18-6001), and lengthening the platform at the current Tracy Station (SJ18-6002). These potential increases in rail activity along existing lines would not be expected to expose nearby sensitive receptors and fragile buildings to significant increases in vibration levels relative to the existing condition. Rail vibration impacts would less than significant due to the minimal increase in train traffic under 2022 RTP/SCS.

Mitigation Measure

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures for applicable transportation projects that would result in vibration impacts, and where feasible and necessary based on site-specific considerations. San Joaquin County and incorporated cities in the County should implement these measures where relevant to land use projects implementing 2022 RTP/SCS. Project-specific environmental documents may adjust this measure as necessary to respond to site-specific conditions.

N-3(a) Vibration Mitigation for Construction of Transportation Projects

Where local vibration and groundborne noise standards do not apply, implementing agencies of 2022 RTP/SCS projects utilizing heavy construction equipment shall estimate vibration levels generated by construction activities and use the Caltrans vibration damage potential threshold criteria to screen for and screen out projects as to their potential to damage buildings on site or near a project.

Caltrans Vibration Damage Potential Threshold Criteria

	Maximum PPV (in/sec)	
Structure and Condition	**Transient Sources**	**Continuous/ Frequent Intermittent Sources**
Extremely fragile historic buildings	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older Residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial structures	2.00	0.50

Source: Transportation and Construction Vibration Guidance Manual, April 2020

If construction equipment would generate vibration levels exceeding acceptable levels as established by Caltrans, implementing agencies of the 2022 RTP/SCS shall, or can and should, complete the following tasks:

- Prior to construction, survey the project site for vulnerable buildings, and complete geotechnical testing (preconstruction assessment of the existing subsurface conditions and structural integrity), for any older or historic buildings within 50 feet of pile driving. The testing shall be completed by a qualified geotechnical engineer and qualified historic preservation professional and/or structural engineer.
- Prepare and submit a report to the lead agency that contains the results of the geological testing. If recommended by the preconstruction report implementing agencies shall require ground vibration monitoring of nearby historic structures. Methods and technologies shall be based on the specific conditions at the construction site. The preconstruction assessment shall include a monitoring program to detect ground settlement or lateral movement of structures in the vicinity of pile-driving activities and identify corrective measures to be taken should monitored vibration levels indicate the potential for building damage. In the event of unacceptable ground movement with the potential to cause structural damage, all impact work shall cease, and corrective measures shall be implemented to minimize the risk to the subject, or adjacent, historic structure.
- To minimize disturbance withing 550 feet of pile-driving activities, implement “quiet” pile-driving technology, such as predrilling of piles and the use of more than one pile driver to shorten the duration of pile driving), where feasible, in consideration of geotechnical and structural requirements and conditions as defined as part of the geotechnical testing, if testing was feasible.
- Use cushion blocks to dampen noise from pile driving.
- Phase operations of construction equipment to avoid simultaneous vibration sources

N-3(b) Vibration Mitigation for Operation of Transportation Projects

Where local vibration and groundborne noise standards do not apply, implementing agencies of 2022 RTP/SCS projects shall comply with all applicable local vibration and groundborne noise standards, or in the absence of such local standards, comply with guidance provided by the FTA in *Transit Noise and Vibration Impact Assessment* (FTA 2018) to assess impacts to buildings and sensitive receptors and reduce vibration and groundborne noise. FTA recommended thresholds shall be used except in areas where local standards for groundborne noise and vibration have been established. Methods that can be implemented to reduce vibration and groundborne noise impacts include, but are not limited to:

- Bus and Truck Traffic
  - Constructing of noise barriers
  - Use noise reducing tires and wheel construction on bus wheels
  - Use vehicle skirts (i.e., a partial enclosure around each wheel with absorptive treatment) on freight vehicle wheels

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are San Joaquin County and incorporated cities within the County. These mitigation measure shall, or can and should, be applied during project permitting and environmental review and implemented during construction, as applicable.

Significance After Mitigation

Implementation of Mitigation Measure N-3(a) would reduce potential construction vibration impacts. However, even with implementation of Mitigation Measure N-3(a), construction vibration from all 2022 RTP/SCS projects may not be reduced below applicable thresholds and impacts would remain significant and unavoidable. No additional mitigation measures to reduce this impact to less than significant levels are feasible. Implementation of Mitigation Measure N-3(b) would reduce potential operational vibration impacts. However, even with implementation of Mitigation Measure N-3(b), vibration from buildout of the 2022 RTP/SCS may continue to be excessive. No additional mitigation measures to reduce this impact to less than significant levels are feasible. Impacts would remain significant and unavoidable.

Threshold 1:	Generate 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
Threshold 2:	Generate a substantial absolute increase in ambient noise

Impact N-4 LAND USE PROJECTS ENVISIONED BY THE 2022 RTP/SCS MAY PLACE SENSITIVE RECEPTORS IN AREAS WITH NOISE LEVELS IN EXCESS OF STANDARDS ESTABLISHED IN THE LOCAL GENERAL PLAN OR NOISE ORDINANCE. THIS IMPACT WOULD BE SIGNIFICANT AND UNAVOIDABLE.

The 2022 RTP/SCS is based on a land use and transportation scenario which defines a pattern of future growth and transportation system investment for the region emphasizing TOD and infill development near transit and other transportation facilities, but development outside these areas could occur as well. Population and job growth is allocated principally within existing urban areas near public transit and existing transit corridors. New noise-sensitive development in infill areas

could be exposed to noise levels exceeding County or incorporated city noise standards for residential land uses, with a lesser potential in more suburban and rural areas. Potential sources of noise exposure include traffic, rail and/or bus operations, commercial activity, and industrial activity. New development in infill areas near transit may also expose existing noise-sensitive uses to noise levels exceeding local noise thresholds. Impacts would be significant because applicable noise standards could be exceeded, or because infill project residents could be exposed to a substantial increase in ambient noise levels.

Mitigation Measures

San Joaquin County and incorporated cities in the County can and should implement the following mitigation measure where relevant to land use projects implementing 2022 RTP/SCS, and where feasible and necessary based on project and site-specific considerations. Project-specific environmental documents may adjust this measure as necessary to respond to site-specific conditions.

N-4 Noise Mitigation for Land Uses

If a 2022 RTP/SCS land use project is located in an area with exterior ambient noise levels above local noise standards, the implementing agency shall ensure that a noise study is conducted to determine the existing exterior noise levels in the vicinity of the project. If the project would be impacted by ambient noise levels, feasible attenuation measures shall be used to reduce operational noise to meet acceptable standards. In addition, noise insulation techniques shall be utilized to reduce indoor noise levels to thresholds set in applicable State and/or local standards. Such measures may include but are not limited to: dual-paned windows, solid core exterior doors with perimeter weather stripping, air conditioning system so that windows and doors may remain closed, and situating exterior doors away from roads. The noise study and determination of appropriate mitigation measures shall be completed during the project's individual environmental review.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for land use projects are San Joaquin County and incorporated cities within the County. This mitigation measure shall, or can and should, be applied during project permitting and environmental review and implemented during construction, as applicable.

Significance After Mitigation

Implementation of Mitigation Measure N-4 would reduce noise for sensitive land uses in areas that exceed noise standards. However, even with implementation of this mitigation measure, noise from buildout of 2022 RTP/SCS may continue to impact nearby noise sensitive receptors and exceed acceptable standards. This impact would remain significant and unavoidable. No additional mitigation measures to reduce this impact to less than significant levels are feasible.

c. Specific RTP Projects That May Result in Impacts

All proposed 2022 RTP/SCS transportation projects listed in Appendix B and summarized in Section 2, *Project Description*, would have the potential to result in noise impacts described in Impacts N-1, N-2, N-3, and N-4. All projects that involve construction activities would result in temporary increases in noise and vibration associated with Impacts N-1 and N-3. The individual projects that would accommodate additional roadway or freeway traffic could create significant noise and

vibration impacts associated with Impact N-2 and N-3. In addition, road widening/extension projects or construction of new roadways have the potential to place roadway traffic noise closer to sensitive receptors. With the number of projects meeting those categories few, this potential impact would be minimal. Land use projects that would include TOD, infill, or other land use development may create significant impacts associated with Impact N-4. Additional specific analysis described in the above mitigation measures would need to be conducted as individual projects are implemented in order to determine the magnitude of project-specific impacts.

4.13.4 Cumulative Impacts

Noise resulting from roadway improvement projects envisioned in the 2022 RTP/SCS could influence ambient noise levels in adjoining counties, if and where the projects are located in proximity to adjoining counties. Therefore, the cumulative impact analysis area for noise consists of the SJCOG region and adjoining counties. Information regarding these adjoining counties can be found in Section 3.1 – Environmental Setting, Table 3-1. Future development in this region that could result in noise impacts is considered in the analysis.

Construction and operation noise and vibration impacts are generally localized and not cumulative in nature. For example, the increase in noise at one location is not worsened by noise created at another location. Rather these effects are independent and the determination as to whether they are adverse is specific to the project and location where they are created. Therefore, this cumulative extent is used to evaluate increases in transportation-related noise and the potential for new sensitive receptors to be located in in areas with unacceptable noise levels within the context of regional noise impacts.

Operation of transportation projects would generate noise. Noise would predominantly be from vehicles, such as the noise of engines or the noise generate from the friction between tires and the roadway surface. Generally, these noises affect ambient noise levels near the roadways. However, some of the 2022 RTP/SCS transportation projects would increase inter-regional travel, because the 2022 RTP/SCS addresses accommodating projected growth and because some projects are on regional roadways, such as Interstate 5 or SR 99. Therefore, the 2022 RTP/SCS would contribute to traffic noise outside the region. The cumulative impact would be significant, and the overall contribution of the 2022 RTP/SCS to significant cumulative traffic noise impacts, despite implementation of Mitigation Measures N-2 and N-4, would be cumulatively considerable.

Future land use development within the cumulative impact analysis area would increase travel and associated cumulative transportation noise levels. Land use development in the SJCOG region combined with the growth outside of its region could potentially contribute to a cumulatively considerable increase in noise as a result of increased activity resulting from that combined growth. This activity would include primarily highway and roadway noise. As a result, 2022 RTP/SCS could result in a cumulatively considerable increase in transportation-related noise. Mitigation Measures N-2 and N-4 would reduce the 2022 RTP/SCS's contribution to these impacts, but not to a less-than-cumulatively-considerable level. Therefore, the contribution of the 2022 RTP/SCS to this significant cumulative noise impacts would be cumulatively considerable.

4.14 Transportation

This section describes the current transportation conditions and examines the effects of the changes in projected land use and transportation projects included in the 2022 RTP/SCS on transportation conditions in 2046. This section evaluates the impacts related to transportation such as changes in travel times, accessibility to jobs, traffic congestion, vehicle miles traveled (VMT), and transit utilization that may result from the implementation of the 2022 RTP/SCS.

4.14.1 Setting

Existing regional transportation networks and facilities in the SJCOG region include an intermodal system consisting of a state and interstate highway system, an inland port, bike and bus routes, passenger and freight rail, and commercial passenger airline service. Figures highlighting these facilities, locations, and routes are included in the 2022 RTP/SCS in Appendix L Modal Discussion. Several major routes traverse the SJCOG region and provide important links for employees and goods to other parts of California, such as the Bay Area and Sacramento.

The SJCOG region transportation system has been designed to meet the multiple needs of both residents and businesses. Geographically near the center of the State, San Joaquin County is strategically positioned and provides key routes and linkages for the movement of goods throughout California and the rest of the United States. The region has one of the few deep-water ports within the State at the Port of Stockton, an airport which serves international markets, key highway corridors, and the hub for a number of major railroads. Given its location, the SJCOG region serves as a major transportation center not only for warehousing and distribution activities, but also as a source of more affordable housing for employees working in the Bay Area.

The SJCOG region also has six airports open to the public that offer a variety of aviation services. Stockton Metropolitan Airport offers general aviation services, daily air cargo flights to serve the logistics sector northern California, and commercial passenger service to Las Vegas, Nevada.

A number of rail lines traverse the SJCOG region and provide services for both passengers and freight. A partnership between the Union Pacific and the Burlington Northern and Santa Fe (BNSF) Corporation operates an intermodal shipping yard providing a key connection for truck-rail freight movement. Amtrak provides passenger service to the County, while Altamont Corridor Express (ACE) provides direct commuter rail service to Silicon Valley (with stops in Stockton, Lathrop, Manteca, and Tracy.

Roadway Network

San Joaquin County has an established network of roadways that serve the transportation needs of residents, visitors, and businesses. There are six major freeways and highways in the area: I-5, I-205, State Route (SR)-99, SR-4, SR-12, and SR-120. Interstate (I)-5 and SR-99 are the major north-south routes that lead north to Sacramento and south to Stanislaus County and the rest of the San Joaquin Valley. SR-12, SR-4, and SR-120 are east-west routes connecting between I-5 and SR-99 and beyond. Interstate 205 runs westward from I-5 and connects with I-580, which continues over the Altamont Pass and into the Bay Area.

Operations

A variety of performance measures are used to assess transportation systems. Depending on the type of performance evaluation required, performance measures may be very specific and focus on

intersections or roadway segments, or performance measures may be aggregated to evaluate the overall operation of a regional transportation system. A regional travel model typically only contains information on the number of lanes, posted speed and link capacity on roadway segments and lacks information detailed enough to calculate accurate intersection information.

Because of the programmatic nature of the proposed 2022 RTP/SCS, the performance measures discussed herein are aggregated as a region to evaluate the overall performance of the transportation system. Roadway transportation performance measures that address performance goals include:

- Total vehicle miles traveled (VMT); and,
- VMT per capita.

The basic measure of the amount of roadway transportation generated is VMT. One vehicle traveling one mile constitutes one vehicle mile traveled, regardless of the size of the vehicle or the number of passengers in the vehicle. Increases in VMT are associated with regional growth that would occur with or without implementation of the proposed 2022 RTP/SCS. Thus, VMT data may not reflect deficient traffic operations,[1] although VMT may have a strong correlation with congestion.

Baseline VMT data for the SJCOG region is shown in Table 4.14-1, below. The 2016 Base Year is used as the baseline for analysis within this EIR. Total VMT data accounts for all vehicle types and all travel within the region, including trips that originate and/or end outside of the SJCOG region, and that pass through the region without having an origin or destination within the SJCOG region. Pursuant to Section 15125(a)(1) of the *State CEQA Guidelines,* although the analysis baseline will normally reflect physical environmental conditions as they exist at the time the notice of preparation is published, "where necessary to provide the most accurate picture practically possible of the project's impacts, a lead agency may define existing conditions by referencing historic conditions." SJCOG has elected to do so here, for the reasons just described.

An area's per capita (or per person) VMT, as applied in this EIR, is the total VMT divided by the population of that area and is a measure of the average vehicle miles each person travels on a typical weekday. Per capita VMT tends to increase as a result of greater overall economic activity in the region, higher levels of per-household automobile ownership, and/or a jobs-housing imbalance that contributes to longer average commute distances.

Table 4.14-1 Baseline VMT for SJCOG Region

Base Year	Regional VMT	VMT per Capita[1]
2016 (2022 RTP/SCS Base Year)	17,015,116	23.24

Source: Appendix A

[1] VMT per capita is based on a population size of 732,185 persons (SJCOG Model)

Additional information about the modeling assumptions and inputs used for the SJCOG model is provided in Appendices M through S of the RTP/SCS.

[1] Traffic operational measures such as roadway congestion and delay are not considered CEQA impacts.

Public Transit

The San Joaquin Regional Transit District (SJRTD) provides bus service throughout the County with the Hopper service. The Hopper provides fixed-route service to the cities of Stockton, Lathrop, and Manteca as well as to the community of French Camp. Additional intercity bus lines provide service to Tracy. SJRTD also offers dial-a-ride services for both the general public and for the elderly/disabled throughout the County. These dial-a-ride services provide transportation seven days a week during nontraditional bus hours in rural areas not served by fixed-route lines. The dial-a-ride programs provide connection services to fixed-route lines and to passenger rail (such as Altamont Corridor Express (ACE) and Amtrak).

SJRTD's Interregional Commuter Service offers bus service to passengers traveling to Alameda, Contra Costa, Santa Clara, and Sacramento counties, including feeder service to BART for employees working in San Francisco and the East Bay. The SJRTD intercity route 91 connects Ripon, Manteca, and Stockton and routes 26 and 90 connect Tracy, Lathrop, French Camp, and Stockton. Routes 93 and 23 link Stockton to Lodi. The interregional service is designed to meet the needs of commuters who travel distances greater than 50 miles one way. Greyhound and Amtrak also provide interregional bus service.

Lodi's Grapeline, the Tracy Tracer, Manteca Transit, and smaller transit services in the cities of Escalon (eTrans) and Ripon (Blossom Express) also provide bus service. The combination of services supports local transit systems, bus rapid transit, intercity and interregional bus transit services, and needed services such as demand response for both those who need transit for medical purposes and those in the rural areas of the County.

Within the 2022 RTP/SCS, approximately $2.9 billion in passenger bus transit operations and $323.8 million in passenger bus transit capital investments are planned. Over half of these funds are targeted for expanding passenger bus service.

Rail

Rail lines in San Joaquin County are used for both passenger and freight services. Several major railways stretch through large portions of the County, including the Union Pacific and BNSF Railroads. Stockton serves as a hub for many of these railways and acts as a major distribution center for freight shipped to locations throughout California and the United States.

The Altamont Corridor Express (ACE), formerly the Altamont Commuter Express, is a commuter rail service in California connecting Stockton with San Jose. It is named for the Altamont Pass, an area through which it travels. The service commenced on October 19, 1998, with two trains daily in each direction (weekdays only). The frequency was increased in November 2009 to three trains daily in each direction and then increased to four trains daily in each direction in September 2012. There are 10 stops along its 86 miles route; present travel time is about 2 hours and 10 minutes from end-to-end. The tracks are owned by Union Pacific. The ACE transit service uses Bombardier Bi-Level Coaches and "MPI F40PH-3C" locomotives. It is managed by the San Joaquin Regional Rail Commission. ACE has planned to extend service south to Ripon, Ceres, Modesto, and Sacramento starting in 2023.

Within the 2022 RTP/SCS, approximately $604 million in passenger rail transit operations and $554.5 million in passenger rail transit capital investments are planned. Over half of these funds are targeted for expanding the current passenger rail system

Active Transportation (Bicycle and Pedestrian Facilities)

Both bicycling and walking within the SJCOG region are attractive transportation alternatives due to the relatively flat topography and temperate climate during much of the year. Bikeways are facilities that provide primarily for, and promote, bicycle travel. The five types of bikeways identified by the California Manual on Uniform Traffic Control Devices and recognized in the SJCOG region are identified below (Caltrans 2014).

- **Class I (Off-Street Bike Paths or Multi-Use Paths).** A Class I bikeway provides physical separation from motor vehicles and are often fully separated from the street. Interactions between bicyclists and vehicles are limited to roadway crossings.
- **Class II (On-Street Bicycle Lanes).** A Class II bikeway is striped adjacent to vehicle travel lanes, delineated either by a solid white line or by a larger hatched buffer space.
- **Class III (Bike Routes).** A Class III bikeway designates certain roadways as preferred streets for bicyclists. They typically include wayfinding signage for bicyclists as well as additional signage to increase driver awareness to the potential presence of bicyclists. Bicycle boulevards are a specific type of Class III Bike Route, best suited for low-speed, low- volume neighborhood streets with traffic calming enhancements. Rural bike routes are another type of Class III Bike Route that usually feature wide shoulders, striping, and intermittent rumble strips to provide space for cyclists to ride on rural roads or highways.
- **Class IV (Separated Bike Lanes).** A Class IV bikeway is located on the street, adjacent to vehicular traffic. Separated bike lanes provide more physical separation between bicyclists and motor vehicles than Class II, as separation always includes both vertical separation (parked vehicles, raised concrete curbs, planters, bollards, etc.) and horizontal separation (striped buffer, landscaped areas, etc.).

In 2012 SJCOG prepared Regional Bicycle, Pedestrian, and Safe Routes to School Master Plan in coordination with its member agencies. The plan is compliant with the California Bicycle Transportation Act which allows all of SJCOG's member agencies to be eligible for state active transportation funding. All of SJCOG's member local agencies have developed Class I, II, or III bicycle facilities to serve bicycle travel. Most agencies including the County and the City of Stockton have long-range plans defining an envisioned future bicycle system. The total investment in active transportation infrastructure provides for over 800 miles of new Class I, II, or III bicycle lanes throughout San Joaquin County. The total revenues made available to support active transportation and complete streets represent a 20.0 percent increase over the 2018 Plan. This includes education, encouragement, and enforcement programs in support of walking and bicycling as well as planning and transit integration projects.

Air Transportation

San Joaquin County has six public airports that serve a variety of needs including air cargo, agricultural shipping, crop-dusting, passenger and corporate flights, flight training, and recreation uses. These airports are:

- Kingdon Executive Airport—Lodi
- Lind's Airport—Lodi
- Lodi (Precissi) Airpark
- New Jerusalem Airport—Vernalis
- Stockton Metropolitan Airport—Stockton

- Tracy Municipal Airport—Tracy

Stockton Metropolitan, Tracy Municipal, and New Jerusalem (outside Tracy) are all public airports while Lind's Airport, the Precissi Airpark, and the Kingdon Airpark are privately owned. Stockton Metropolitan Airport is the largest airport in the County, offering limited passenger service to Las Vegas via Allegiant Air. In addition to Las Vegas, Stockton Municipal Airport has commercial service to Phoenix Sky Harbor International Airport. The Tracy Municipal Airport is used for general aviation such as business flights, flight training, and recreation uses. While Lind's Airport in Lodi is privately owned, it is one of the most active public access airports in the County. The airport accommodates general aviation aircraft, including business jets. The remaining airports are used for small aircraft including business flights and crop-dusting activities.

Emerging Travel and Mobility Options and Technology

New transportation technologies can have an important influence on regional and national transportation systems, and some have already started to change longstanding transportation behaviors. Several new options that affect vehicle trips have begun emerging around the nation in the last decade. For example, transportation network companies, such as Uber and Lyft, provide ridesharing opportunities, similar to taxi for-hire services but are reserved for on-demand users who can request a ride through a smartphone app. Such services contract drivers using their personal vehicles to provide on-demand rides. These services began operations in roughly 2013 and operations continue today.

Micromobility, in the form of application-reservation-based e-scooters and bikeshare, is another emerging trend that was largely introduced in 2017. The micromobility industry has been highly volatile as many startup companies have emerged, consolidated, and/or discontinued operations over the last few years. Other transportation innovations include the following: connected and autonomous vehicles; mobility aggregation applications that provide users with one source for mobility services (e.g., Moovel, CityMapper); coordinated and adaptive traffic signals; active traffic management, which provides the ability to dynamically manage traffic through use of strategies such as adaptive ramp metering and adaptive traffic signal control; and unmanned aircraft systems. These and other emerging technologies have the potential to transform mobility choices and alter the transportation landscape.

Application-based food delivery services, such as UberEats, Grubhub, Doordash, and Postmates, have also expanded dramatically in recent years. Such services were fueled by the COVID-19 pandemic which limited or periodically closed dining at restaurants through most of 2020 and early 2021. Drivers for such food delivery services may operate trips for multiple food delivery and passenger applications simultaneously, depending on where demand is highest. Delivery of packages and parcels through traditional methods such as the Postal Service, UPS, FedEx, and newcomers like Amazon Prime also saw expansion as a result of the COVID-19 pandemic with trends increasing towards online shopping, resulting in fewer trips to traditional retail centers.

Beyond new travel options, emerging vehicle technology is beginning to influence travel behavior and safety. For example, smartphone applications such as Google Maps and Waze better inform travelers regarding route options, comparative costs, and dynamic routing to avoid significant delays. Safety technology on newer vehicles can include assisted braking, lane guidance, and attentiveness alerts, all of which could reduce risk of collisions. Such features will likely become standard on most vehicles in the coming years. As collisions decline, some congestion-related collisions could be reduced over time.

Transportation Demand Management/Transportation System Management

Transportation Demand Management (TDM) refers to all programs and strategies that are intended to reduce the number of vehicle trips required over the transportation network or shift the distribution of trips between time periods across the network (FHWA 2012). Transportation System Management represents a variety of management techniques designed to improve the efficiency and effectiveness of the transportation system. These techniques improve operations and/or services of existing and future transportation networks (FHWA 2012).

Vehicle Flow Management

The Department of Energy's Fuel-Efficient Traffic Signal Management Program has assisted in increasing the number of synchronized traffic signals within the region to promote free flowing vehicle transportation conditions, less use of vehicle fuel, and decreased pollution due to less vehicle miles traveled. In the past, some jurisdictions have implemented minor design improvements to the existing transportation infrastructure in lieu of costly capital construction or reconstruction. In the future, signalization, channelization, and the construction of acceleration and deceleration lanes with ramp metering at key interchanges are expected to achieve roadway vehicle flow improvements.

Intermodal Transportation

Transportation engineers and planners in the SJCOG region have employed one or more of the following methods of enhancing intermodality to increase the use of the existing transportation capacity more efficiently:

- Coordinate transit routes and schedules with those of inter-city rail and bus service;
- Provide amenities and facilities for bicycle and pedestrian access to transit stops;
- Facilitate and encourage access to the regional air carrier airport by paratransit, transit, taxi, transportation network companies and bicycle; and
- Provide park and ride facilities with bicycle, pedestrian and transit access amenities.

Ridesharing

Rideshare programs help reduce congestion and improve traffic flow. Regionally, SJCOG operates a multi-county rideshare program called Dibs (formerly Commute Connection). The rideshare program is designed to facilitate carpooling, vanpooling, bicycling, walking, and riding transit.

Preferential Transit/Carpool Treatment/Electric Vehicle Charging

Methods employed by local jurisdictions to encourage people to reduce their use of single-occupant vehicles include preferential parking for carpools and vanpools; subsidized transit passes; use of agency vans for vanpooling; and provision of an on-site transportation coordinator. Regional transit agencies strive to ensure that major developments within their service areas are transit accessible and that transit stops are located to promote transit use.

Shared Parking Facilities

Parking management refers to programs that result in more efficient use of parking resources and can either provide an incentive or disincentive to single occupant vehicle use. Parking facilities that are shared between multiple users and destinations are found within the region. Park and ride lots

are a form of off-site shared parking facilities that facilitate ridesharing. Park and ride lots within the region have been placed in locations where people can easily meet and form carpool trips, such as the Tracy Transit Center. Park-and-ride facilities are located in Lathrop, Lodi, Stockton, and Tracy. SJCOG's various jurisdictions may also construct parking structures and create parking legislation as feasible and necessary.

4.14.2 Regulatory Setting

a. Federal Laws, Regulations, and Policies

Moving Ahead for Progress in the 21st Century Act

The Moving Ahead for Progress in the 21st Century Act (MAP-21), was enacted in 2012. Through the medium-term plan development process, MAP-21 encourages Metropolitan Planning Organizations (MPOs), such as SJCOG, to consult with officials responsible for other types of planning activities that are affected by transportation in the area (including State and local planned growth, economic development, environmental protection, airport operations and freight movements) or to coordinate its planning process, to the maximum extent practicable, with such planning activities (23 U.S.C. §134(g)(3)(A)).

Specifically, MAP-21 requires that the medium-term planning process provide for consideration of projects and strategies that will:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency;
- Increase the safety of the transportation system for motorized and non-motorized users;
- Increase the security of the transportation system for motorized and non-motorized users;
- Increase the accessibility and mobility of people and for freight;
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- Promote efficient system management and operation; and
- Emphasize the preservation of the existing transportation system (23 U.S.C. §134(h)(1)).

Fixing America's Surface Transportation Act

Fixing America's Surface Transportation (FAST) Act builds on the changes made by MAP-21 and was signed into law in December 2015 (Public Law 114-94). The FAST Act authorizes $305 billion through fiscal year 2020 for highways, highway and motor vehicle safety, public transportation, rail and research and technology programs and provides a dedicated source of federal funds for freight projects. The FAST Act expands the scope of consideration of the metropolitan planning process to include consideration of intercity transportation, including intercity buses, intercity bus facilities and commuter vanpool providers; improving transportation system resiliency and reliability; reducing or mitigating the stormwater impacts of surface transportation; and enhancing travel and tourism. In addition, it requires strategies to reduce the vulnerability of existing transportation infrastructure to natural disasters.

Under the FAST Act, the U.S. Department of Transportation requires that MPOs, such as SJOG, prepare long-range transportation plans and update them every four years if they are in areas designated as "nonattainment" or "maintenance" for federal air quality standards. Before enactment of the FAST Act and its predecessor, MAP-21, the primary federal requirements regarding long-range transportation plans were included in the metropolitan transportation planning rules (23 CFR Part 450 and 49 CFR Part 613). The FAST Act makes a number of changes to the statutes that underpin these regulations. Per federal requirements, long-range transportation plans must:

- Be developed through an open and inclusive process that ensures public input; seeks out and considers the needs of those traditionally under served by existing transportation systems; and consults with resource agencies to ensure potential problems are discovered early in the planning process;
- Be developed for a period of not less than 20 years into the future; long-range transportation plans must reflect the most recent assumptions for population, travel, land use, congestion, employment and economic activity;
- Have a financially constrained element, transportation revenue assumptions must be reasonable, and the long-range financial estimate must take into account construction-related inflation costs;
- Include a description of the performance measures and performance targets used in assessing the performance of the transportation system;
- Include a system performance report evaluating the condition and performance of the system with respect to performance targets adopted by the state that detail progress over time;
- Include multiple scenarios for consideration and evaluation relative to the state performance targets as well as locally-developed measures.
- Conform to the applicable federal air quality plan, called the State Implementation Plan, for ozone and other pollutants for which an area is not in attainment; and
- Consider planning factors and strategies in the local context.

On September 30, 2020, the United States Senate approved H.R. 8337, which provides fiscal-year 2021 appropriations to federal agencies for continuing projects and activities of the federal government. Included in this act is a 1-year, $13.6 billion extension of the FAST Act.

Infrastructure Investment and Jobs Act

The Infrastructure Investment and Jobs Act (IIJA) replaced the expired FAST Act and was signed into law in November 2021 (Public Law 117-58). The IIJA authorizes $973 billion through Fiscal Year 2022 for investment in all modes of transportation as well as investment in water, power and energy, environmental remediation, public lands, broadband, and overall resilience. The Act distributes the federal funds in three ways (National Association of Counties [NACO] 2022):

- Authorizations from the federal Highway Trust Fund for highway and transit programs;
- Authorizations of appropriations from the General Fund of the U.S. Treasury, subject to annual appropriations process; and
- Advanced appropriations over five years, independent of the regular appropriations process.

Of the $973 billion, $550 billion is to be allocated for new investments, such as funding provided through a surface transportation authorization law. Of the $550 billion dedicated to new

investments, $284 billion will be distributed to the U.S. Department of Transportation in order to modernize and make improvements across all modes of transportation. Those funds are reserved for the following (NACO 2022):

- Roads & Bridges: $110 billion
- Transit: $39 billion
- Rail: $66 billion
- Safety: $11 billion
- Airports: $25 billion
- Ports & Waterways: $17 billion
- Electric vehicle chargers: $7.5 billion
- Electric buses: $7.5 billion
- Reconnecting Communities: $1 billion

Counties and MPOs, such as SJCOG, can access the IIJA funds competitively, through federal grant programs and competitive processes run by state departments of transportation and MPOs, through suballocations based on populations from state departments of transportation, and through federal formulas such as transit formulas and the formula (entitlement) component of the Airport Improvement Program. Overall, the IIJA establishes a new, long-term surface transportation reauthorization and significantly increases the number of competitive grant opportunities via supplemental appropriations to the U.S. Department of Transportation (NACO 2022).

Specifically, California can expect to receive approximately $29.5 billion over five years in Federal highway formula funding for state highway and bridge projects. The IIJA will assist in repairing and rebuilding roads and bridges with a focus on climate change mitigation, resilience, equity, and safety for all users, including cyclists and pedestrians. Additionally, the IIJA will improve healthy, sustainable transportation options for millions of Americans; California can expect to receive approximately $10.3 billion over five years to improve public transportation options across the state. Finally, the IIJA is expected to help modernize and expand passenger rail in California while improving freight rail efficiency and safety (U.S. Department of Transportation 2022).

Congestion Management Process

The Congestion Management Process (CMP), as defined in federal regulation, is intended to serve as a systematic process that provides for safe and effective integrated management and operation of the multimodal transportation system. The process includes:

- Development of congestion management objectives;
- Establishment of measures of multimodal transportation system performance;
- Collection of data and system performance monitoring to define the extent and duration of congestion and determine the causes of congestion;
- Identification of congestion management strategies;
- Implementation activities, including identification of an implementation schedule and possible funding sources for each strategy; and
- Evaluation of the effectiveness of implemented strategies.

The enactment of this legislation required all MPOs serving a transportation management area (TMA) maintain a congestion management process (CMP). A CMP is a systematic and regionally accepted approach for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meet state and local needs. The Moving Ahead for Progress in the 21st Century bill expired in 2014 and was replaced by the FAST Act, which subsequently expired in September 2021. SJCOG adopted their Regional Congestion Management Process in August of 2021. The Regional Congestion Management Program (RCMP) serves as a mechanism to fulfill SJCOG's requirements as a metropolitan area with a population exceeding 200,000, under the Federal Congestion Management Process. In addition, there is an opportunity to integrate Performance-Based Planning and Programming (PBPP) performance metrics and provide information of interest to our jurisdictions.

A key focus of the Federal CMP aims to reduce single-occupant-vehicle (SOV) travel while minimizing the need for increasing SOV roadway capacity. It also provides additional resources for the development and deployment of new congestion management technologies. For areas designated as non-attainment of Federal air quality standards such as San Joaquin County, the Federal Congestion Management Process stipulates (23 CFR 450.320 (d)) that Federal funds may not be programmed for any project that results in a significant increase in the carrying capacity of single occupancy vehicles (i.e., new general purpose lanes with the exception of safety improvements or the elimination of bottlenecks) unless the project is addressed through a federally compliant congestion management process. For SOV capacity increasing projects proposed to be advanced with Federal funds, an analysis is required to demonstrate that all reasonable travel demand reduction and operational management strategies have been implemented to the fullest extent possible.

b. State Laws, Regulations, and Policies

California Transportation Plan

The California Transportation Plan is prepared by the California State Transportation Agency every five years to provide a long-range policy framework to meet the State's future mobility needs and reduce greenhouse gas (GHG) emissions to goals set by the California Global Warming Solutions Act of 2006 (Assembly Bill [AB 32], discussed in Section 4.9, *Greenhouse Gas Emissions/Climate Change*) and implementing legislation Senate Bill (SB) 375 (discussed below). The most recent California Transportation Plan was adopted in 2021 (Caltrans 2021). The California Transportation Plan defines goals, performance-based policies, and strategies to achieve the State's collective vision for California's future statewide, integrated, multimodal transportation system by envisioning a sustainable system that improves mobility and enhances quality of life. The California Transportation Plan is developed in collaboration with transportation stakeholders such as SJCOG. Through ongoing engagement, the California Transportation Plan is intended to provide goals and visions to support a fully integrated, multimodal, sustainable transportation system that supports the quality of life, prosperous economy, human and environmental health, and social equity.

California Transportation Commission Regional Transportation Plan Guidelines

The California Transportation Commission (CTC) publishes and periodically updates guidelines for the development of long-range transportation plans, such as SJCOG's proposed 2022 RTP/SCS. Pursuant to Government Code Section 65080(d), each regional transportation planning agency

(RTPA) is required to adopt and submit an updated RTP to CTC and Caltrans every four years. SJCOG is the designated RTPA for San Joaquin County.

Under Government Code Section 14522, the CTC is authorized to prepare guidelines to assist in the preparation of RTPs. The most recent update to the RTP guidelines was published in 2017 and includes separate guidance for RTPAs and MPOs and new checklists for RTP content (CTC 2017).

Climate Action Plan for Transportation Infrastructure

The Climate Action Plan for Transportation Infrastructure was adopted on July 12, 2021 (CalSTA 2021). The Climate Action Plan for Transportation Infrastructure details how the state recommends investing billions of discretionary transportation dollars annually to aggressively combat and adapt to climate change while supporting public health, safety, and equity. The Climate Action Plan for Transportation Infrastructure builds on executive orders signed by Governor Gavin Newsom in 2019 and 2020 targeted at reducing GHG emissions in transportation, which account for more than 40 percent of all emissions, to reach the state's ambitious climate goals (CalSTA 2021).

State Regional Transportation Plan Requirements

Government Code Sections 65080 et seq. state that MPOs must prepare and adopt a long-range transportation plan, such as an RTP, directed at achieving a coordinated and balanced regional transportation system, including, but not limited to, mass transportation, highway, railroad, maritime, bicycle, pedestrian, goods movement and aviation facilities and services. The plan must be action-oriented and pragmatic, considering both the short-term and long-term planning, and shall present clear, concise policy guidance to local and state officials. Each transportation planning agency must consider and incorporate, as appropriate, the transportation plans of cities, counties, districts, private organizations and state and federal agencies.

Pursuant to Government Code section 65080(d), MPOs, such as SJCOG, that are located in nonattainment and monitoring areas must update their long-range transportation plans at least every four years.

The CTC has developed RTP guidelines to assist MPOs with developing their RTPs so that they are consistent with federal and state transportation planning requirements. The guidelines are updated and adopted periodically, as needed. For the first time, two separate guidelines were adopted in January 2017 to guide RTP development in MPOs and RTPAs. Both documents incorporate new legislation and the associated goals, particularly related to reducing GHG emissions and improving air quality. Both the 2017 RTP Guidelines for MPOs and the 2017 RTP Guidelines for RTPAs specify that the requirements outlined in the documents apply to all RTP updates begun following adoption (CTC 2017).

The 2017 RTP Guidelines include guidelines for regional travel demand modeling. The regional travel demand model guidelines are “scaled” to different sizes of MPOs. The guidelines also describe the methods for projecting of future travel demand, as well as the key assumptions typical of transportation demand models. In addition, the guidelines describe the consultation and coordination process, which are designed to foster involvement by all interested parties including air quality agencies, discuss the environmental considerations of an RTP, and list the general contents of an RTP document (CTC 2017).

Senate Bill 375

The Sustainable Communities and Climate Protection Act of 2008 (Chapter 728, Statues of 2008) (SB 375) diversified the areas of study from past RTPs to include land use impacts and climate change issues. Specifically, SB 375 requires MPOs to prepare a SCS that demonstrates how the region will meet its GHG reduction targets through integrated land use, housing, and transportation planning. The SCS must identify a transportation network that, when integrated with the forecasted development pattern for the SJCOG region, will reduce GHG emissions from automobiles and light trucks in accordance with targets set by the California Air Resources Board (CARB).

Under SB 375, some development and transportation projects assumed as a part of the proposed 2022 RTP/SCS may be eligible to use a streamlined version of the environmental review process. Among other criteria, these projects must be consistent with the land use designation, density, intensity, and policies of the proposed 2022 RTP/SCS, and fall within the identified criteria for development and transportation projects. Streamlining under SB 375 is described in more detail in Section 1.5.1, *Streamlining Under SB 375*.

Senate Bill 743

SB 743 (2013) changed the way that public agencies evaluate the transportation impacts of projects under CEQA, recognizing that roadway congestion, while an inconvenience to drivers, is not itself an environmental impact. (See PRC Section 21099(b)(2) ["automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment pursuant to [CEQA]"].)

Under SB 743, the Governor's Office of Planning and Research (OPR) established VMT as the preferred metric for measuring transportation impacts of most projects in place of vehicle level of service (LOS) or related measures of congestion as the primary metric. The use of VMT for determining significance of transportation impacts has become commonplace since the certification of this provision and the release of OPR's Technical Advisory on Evaluating Transportation Impacts in CEQA in December 2018 and, as of July 1, 2020, is the required metric statewide (OPR 2018).

For land use projects, SB 743 provides opportunities to streamline transportation analysis under CEQA for qualifying urban infill development near major transit stops in metropolitan regions statewide, as described in more detail in Section 1.5.3, *Streamlining Under SB 743*. Additionally, the legislation establishes that aesthetic and parking impacts of these projects are not considered significant impacts on the environment.

SB 743 can also substantially affect the review of transportation projects under CEQA. Some projects, such as expanding facilities for bicycle, pedestrian, or transit only use, will not result in adverse transportation impacts because they are assumed not to substantially increase automobile trips. However, for roadway capacity projects, the CEQA guidelines (Section 15064.3) give lead agencies some discretion over what metric is used to evaluate transportation impacts, as some roadway expansion projects can induce vehicle travel. If using a metric besides VMT, however, the change in vehicle travel should still be reported. A program-level assessment of roadway projects in a regional plan may also be used to streamline project level analysis (OPR 2018).

Caltrans has provided two guidance documents to address VMT impacts on the state highway system consistent with the requirements of SB 743 and the OPR Technical Advisory:

- The Transportation Analysis under CEQA (TAC) provides information to support CEQA practitioners in making CEQA significance determinations for transportation impacts of projects

on the state highway system. These could include land use projects or transportation projects (Caltrans 2020b).

- The Transportation Analysis Framework (TAF) guides the preferred approach for analyzing the VMT attributable to proposed projects (induced travel) in various project settings, with particular focus on the analysis of induced travel associated with transportation projects which would add road capacity to the transportation system (Caltrans 2020c).

State CEQA Guidelines Section 15064.3 and OPR Technical Advisory

State CEQA Guidelines Section 15064.3 implements SB 743 and establishes VMT as the most appropriate measure of transportation impacts. The primary components of Section 15064.3 include:

- Identifies VMT as the most appropriate measure of transportation impacts;
- Declares that a project's effect on automobile delay shall not constitute a significant environmental impact (except for projects increasing roadway capacity);
- Creates a rebuttable presumption of no significant transportation impacts for (a) land use projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor, (b) land use projects that reduce VMT below existing conditions, and (c) transportation projects that reduce or have no impact on VMT;
- Allows a lead agency to qualitatively evaluate VMT if existing models are not available; and
- Gives lead agencies discretion to select a methodology to evaluate a project's VMT, but requires lead agencies to document that methodology in the environmental document prepared for the project.

CEQA lead agencies were required to comply with the State Guideline Section 15064.3 no later than July 1, 2020. The OPR in its *Technical Advisory on Evaluating Transportation Impacts in CEQA* has provided some language regarding the use of VMT (OPR 2018). Specifically, a threshold of 15 percent less VMT per capita than existing average VMT for the area is relevant for analyzing impacts related to the 2022 RTP/SCS, pursuant to the following language:

> Based on OPR's extensive review of the applicable research, and in light of an assessment by the CARB quantifying the need for VMT reduction in order to meet the State's long-term climate goals, OPR recommends that a per capita or per employee VMT that is 15 percent below that of existing development may be a reasonable threshold. [¶] Fifteen percent reductions in VMT are achievable at the project level in a variety of place types. [¶] Moreover, a 15 percent reduction is consistent with SB 743's direction to OPR to select a threshold that will help the State achieve its climate goals. As described above, section 21099 states that the criteria for determining significance must "promote the reduction in greenhouse gas emissions." In its document the CARB 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals, CARB assesses VMT reduction per capita consistent with its evidence-based modeling scenario that would achieve State climate goals of 40 percent GHG emissions reduction from 1990 levels by 2030 and 80 percent GHG emissions reduction levels from 1990 by 2050. Applying California Department of Finance population forecasts, CARB finds per-capita light-duty vehicle travel would need to be approximately 16.8 percent lower than existing, and overall per-capita vehicle travel would need to be approximately 14.3 percent lower than existing levels under that scenario. Below these levels, a project could be considered low VMT and would, on that metric, be consistent with 2017 Scoping Plan Update assumptions that achieve climate state climate

> goals… [¶] In summary, achieving 15 percent lower per capita (residential) or per employee (office) VMT than existing development is both generally achievable and is supported by evidence that connects this level of reduction to the State's emissions goals (OPR 2018).

Assembly Bill 1358

AB 1358, also known as the Complete Streets Act of 2008, amended the California Government Code Section 65302 to require that any substantive revisions to a city or county's Circulation Element include provisions for accommodations of all roadway users, including bicyclists and pedestrians.

California Bicycle Transportation Act

The California Bicycle Transportation Act of 1994 requires all cities and counties to have an adopted bicycle master plan to apply for Bicycle Transportation Account funding source. Existing bicycle master plans and other modal plans adopted within the SJCOG region are described below.

c. Regional Laws, Regulations, and Policies

Regional Transportation Planning Agency Transportation Plans

As described in Section 1.2, *Project Background*, SJCOG functions as both the federally-designated MPO and the State-designated regional transportation planning agency RTPA for San Joaquin County. Under federal regulations (23 CFR 450.322(c)) and State law (Government Code 65080(d)), SJCOG is required to prepare a long-range (at least 20-year) transportation planning document, known as the RTP. The RTP must be updated every four years and must be consistent with the California Transportation Plan. The RTP is generally an action-oriented document used to achieve a coordinated and balanced regional transportation system.

The 2018 Regional Transportation Plan (2018 RTP) was the last regional transportation plan adopted by SJCOG. As a foundation for this RTP, many of the policies and strategies from the 2018 RTP remain relevant and have been carried forward. RTP/SCS changes to the policies and strategies in the 2018 RTP were primarily made to ensure consistency of the 2022 RTP/SCS with SB 375 and to delete strategies that were completed since the 2018 RTP/SCS. Upon approval, the 2022 RTP/SCS will supersede all of the policies and strategies in the 2018 RTP. Therefore, the specific policies and strategies contained in the 2022 RTP are not included in this analysis.

San Joaquin Council of Governments Regional Transportation Impact Fee

SJCOG, in coordination with its member agencies, implements a regional transportation impact fee as part of a county-wide multi-jurisdiction capital improvement program to assist with the costs of new transportation facilities or other transportation and transit improvements. Establishment in 2006, the RTIF has been updated in 2012 and 2017, with addenda adopted in 2018 and 2020.

d. Local Laws, Regulations, and Policies

General Plans

State law requires cities and counties to adopt general plans, which must incorporate a circulation element, also often called a transportation element. A general plan's transportation/circulation element is an infrastructure plan and policy document used to determine the needed expansion or

modification of the transportation network (including services) to accommodate planned population and employment growth. The elements generally address expectations for transportation network operations and safety based on goals and policies of the city or county. The elements also often address goods movement, public transit, bicycle facilities and pedestrian facilities.

Transportation provisions in applicable county and city general plans for the SJCOG region are discussed below.

San Joaquin County General Plan

The San Joaquin County 2035 General Plan's Public Facilities and Services Element contains the Transportation and Mobility Section, providing the framework for the Countywide transportation system. The Transportation and Mobility section focuses on multi-modal improvements to guide the funds for transportation within the county in a context-sensitive manner that benefits residents the most (San Joaquin County 2016).

City of Escalon General Plan

The Escalon General Plan Circulation Element discusses standards for roadway design, future services, and impact of roadways on residents. Its goals, as stated, are to "Coordinate the transportation and circulation system with planned land uses, promote the safe and efficient transport of goods and the safe and effective movement of all segments of the population, make efficient use of existing transportation facilities, and protect environmental quality and promote the wise and equitable use of economic and natural resources." The plan spans various modes, centers Escalon in the regional transportation network, and strives to improve overall circulation within the City of Escalon (City of Escalon 2010).

City of Lathrop General Plan

The Transportation & Circulation component of the Community Development Element of the City of Lathrop discusses projected regional demand and land use in Lathrop and the projected roadway needs. The Plan discusses the proximity of Lathrop to interregional and interstate air, rail, truck, and automobile networks, and how this proximity might be improved with multiple proposed projects that enhance regional connectivity (City of Lathrop 1991).

City of Lodi General Plan

The City of Lodi general plan Transportation Element seeks to provide access to employment, education, and recreation through improved access to commercial, industrial, recreational, and public service centers, while reducing the impact of airborne emissions. The transportation element takes an in-depth multimodal look at how residents could be even better served by a further improved transportation system (City of Lodi 2010)

City of Manteca General Plan

As of the drafting of this EIR, the City of Manteca has begun the process of finalizing its 2021 General Plan. The Circulation element focuses on regional coordination to improve Manteca's roadways, as well as needed updates to City policies in regards to statewide legal changes. The element begins with a focus on multimodal accessibility and discusses how Manteca can respond to changes in technology and the SJCOG region (City of Manteca 2021).

City of Ripon General Plan

The circulation and transportation chapter of the City of Ripon's General Plan 2040 seeks to create a robust transportation system that provides adequate access across the planning horizon while limiting subsequent effects of the expansion. The City, divided into parts by State Route 99, the Stanislaus River, and two railways, creates an internal circulation challenge, which the plan proposes to address. The plan also covers potential transit improvements and a multimodal plan (City of Ripon 2006).

City of Stockton General Plan

The transportation section of Envision Stockton 2040 is organized around four key goals: mobile community, active community, sustainable transportation, and effective transportation assessments. The plan focuses on providing mobility for all communities, including transition to a "complete streets" framework, greater active transportation opportunities, effective mitigation of traffic-related harms for transportation land uses, and infrastructure design that limits pollution exposure and traffic deaths (City of Stockton 2018).

City of Tracy General Plan

The circulation element of the general plan of the City of Tracy seeks to balance its role as a major regional logistics hub with residents' needs. The plan gives details on how the City should maintain a high-quality infrastructure network for all users and all modes, while maintaining a high quality of connectivity and interregional access (City of Tracy 2011).

Local Transportation Fee Programs

The local jurisdictions in the SJCOG region all charge development fees to mitigate transportation impacts on their locally owned and operated roadways that are not considered part of the regional transportation network. Some also charge fees to assist with the maintenance and construction of infrastructure for regionally significant routes.

4.14.3 Impact Analysis

a. Methodology and Significance Thresholds

The criteria for determining whether the RTP/SCS would have significant environmental impacts related to transportation and traffic were based in part on the environmental checklist in Appendix G of the State CEQA Guidelines (14 CCR 15000 et seq.) and on performance measures established by SJCOG. Significant impacts to transportation would occur if the plan would:

1. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities;
2. Conflict with or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b), specifically resulting in
    a. An overall increase in total regional VMT above baseline (2016) conditions;
    b. A change in VMT per capita in the region that fails to reach 15 percent below baseline (2016) VMT per capita conditions; or
    c. A substantial increase in induced travel due to roadway capacity expansions;

3. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
4. Result in inadequate emergency access; or,
5. Impair implementation or physically interfere with an adopted emergency response plan or emergency evacuation plan

SJCOG develops and applies state-of-the-art models integrated into a comprehensive modeling and forecasting framework to develop growth projections, travel forecasts, and emissions estimates intended to support the region's various planning programs. For analysis of the 2022 RTP/SCS, SJCOG refined the travel demand model used for the previous 2018 RTP/SCS to focus more sharply on the SJCOG region only for the purposes of improving model performance and validation. This refined 1-county SJCOG model was updated with sociodemographic details and existing roadway network refinements to reflect the planned projects included in the 2022 RTP/SCS. The model output was evaluated to confirm that model performance is consistent with the previous version. This sub-area version reduced the 3-County MIP2 travel demand model to a 1-County model, covering only the SJCOG region, for the purposes of improving model performance and validation. The 1-county SJCOG model was updated with sociodemographic details and existing roadway network refinements to reflect the planned projects included in the 2022 RTP/SCS. The model output was evaluated to confirm that model performance is consistent with the previous version.

Per SB 743, the primary determinant of transportation impacts is now vehicle miles travelled, or VMT. One "VMT" is one vehicle traveling on a roadway for one mile. Regardless of how many people are traveling in the vehicle, each vehicle traveling on a roadway within the region produces VMT.

For the purposes of this EIR, VMT is estimated and projected for a typical weekday. VMT has been a primary indicator of travel for policy-makers and transportation professionals for decades.

Transportation data was supplied by SJCOG based on forecasts developed using the Tri-County Valley Model Improvement Program (VMIP2) travel demand model (SJCOG Model). This three-county model (Merced, Stanislaus, and San Joaquin counties) characterizing the transportation environment was developed in accordance with and validated to state/federal standards including the 2022 California Transportation Commission RTP Guidelines.

Model inputs are listed below.

- Socioeconomic Data by Traffic Analysis Zone
- Roadway Network Characteristics by Functional Classification of Roadway
- Land Use and Accessibility for Auto Ownership Model
- Land Use, parking, Travel Demand Model (TDM), Walk and Bike for Mode Choice Model
- Transit Networks
- External Trips (inter-regional trips)

The model includes modules that incorporate household characteristics (size, number of workers, income, single-family or multi-family unit); auto ownership; trip generation; trip distribution; mode choice (e.g., single-occupant vehicle, multi-occupant vehicle, transit and active modes (walking and cycling); and traffic assignment to the transportation network. The RTP/SCS foundation is comprised of recent household and job growth forecasts, market demand and economic studies, and transportation studies including SJCOG's Smart Growth Transit Oriented Development Plan, Goods Movement Study, and Regional Bike/Pedestrian Master Plan.

When additional capacity is provided on a roadway, a short-term gain in reducing delay on the roadway is typically observed. However, additional capacity will often encourage additional trips amongst existing users in the long term, thus increasing VMT overall. These new trips are generated for a variety of reasons, including drivers who were using an alternative mode previously but now are driving (e.g., driving instead of taking transit), or drivers who now choose to make a trip that previously they had forgone (e.g., someone going shopping or picking up dinner that was previously staying home for dinner). This phenomenon is referred to as induced demand. Induced demand effects are generally considered under two-time frames: short term (0-5 years), which includes effects such as diverted trips, mode shift resulting from driving becoming more attractive, and latent trips (new trips that were previously suppressed by congestions); and long term (5-10 years), which includes effects such as destination changes from new land uses, mode shift resulting from transit service provider impacts, and increasing auto dependency.

To account for induced demand associated with the proposed 2022 RTP/SCS in a manner consistent with CARB requirements, it was determined that the VMT data obtained from the travel demand model should be augmented using the California Induced Travel Calculator[2]. This calculator allows a user to estimate the total (both short-term and long-term) induced demand VMT annually added as the result of the new construction of general-purpose lane miles, high-occupancy vehicle lane miles, or high-occupancy toll lane miles. In particular, induced demand analysis is required by CARB during SB 375 analysis for FHWA functional classifications of Interstate (class 1), other freeway and expressways (class 2), and other principal arterials (class 3). Based on a review of model sensitivities, it was determined that the travel demand adequately accounts for the effects of short term induced demand and, as such, only the long-term effects of induced demand from the calculator were added to VMT results from the travel demand model in order to fully account for induced demand.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with transportation projects and the land use scenario contained within the proposed 2022 RTP/SCS. Section 4.14.3.c summarizes the impacts associated with capital improvement projects in the proposed 2022 RTP/SCS. Due to the programmatic nature of the proposed 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvement projects and future projects under the land use scenario envisioned by the proposed 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1:	The project would conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities

Impact T-1 TRANSPORTATION PROJECTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD NOT CONFLICT WITH ANY PROGRAM, PLAN, ORDINANCE OR POLICY ADDRESSING THE CIRCULATION SYSTEM, INCLUDING TRANSIT, ROADWAY, BICYCLE AND PEDESTRIAN FACILITIES. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

The proposed SJCOG 2022 RTP/SCS is intended to improve the circulation system for all modes of transportation so that motor vehicles and non-motorized vehicles can use the streets simultaneously and safely. Specifically, the proposed 2022 RTP/SCS includes goals and objectives on a federal, state, and regional level that aim to: achieve a significant reduction in traffic fatalities and

[2] https://travelcalculator.ncst.ucdavis.edu

serious injuries on all public roads; maintain the highway infrastructure asset system in a state of good repair; achieve a significant reduction in congestion on the National Highway System; improve the efficiency of the surface transportation system; enhance the performance of the transportation system while protecting and enhancing the natural environment; and, improve overall mobility and accessibility. Overall, the goals and objectives included in the proposed 2022 RTP/SCS are intended to ensure that future transportation projects would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

Transportation projects included under the proposed 2022 RTP/SCS consist of widening existing roadways; constructing expressways and freeways; and installing medians. Such projects would result in capacity increases, congestion relief, safety improvements, and overall circulation improvements. Therefore, the proposed 2022 RTP/SCS would be consistent with the California Transportation Plan and individual jurisdiction General Plans, as well as the goals and objectives outlined within the 2018 RTP/SCS and the proposed 2022 RTP/SCS, which are described above. Active transportation projects included under the proposed 2022 RTP/SCS would add new pedestrian and bicycle facilities including sidewalks, bike lanes, multi-use trails, bicycle and pedestrian bridges, and bike parking facilities; improve existing facilities; improve active transportation signage and striping; implement Safe Routes to School projects; and upgrade pedestrian facilities with ADA modifications. Bicycle and pedestrian improvement projects identified in the proposed 2022 RTP/SCS are aimed primarily at improving bicycle and pedestrian safety and accessibility. Pedestrian and bicycle facilities would be designed and constructed in compliance with applicable safety regulations, such as the California Manual of Uniform Traffic Control Devices (Caltrans 2014). Transit projects included under the proposed 2022 RTP/SCS would bolster the existing operational network; improve transit centers; and improve transit facility amenities. Such projects would result in increased transit ridership and improved rider experiences. Therefore, the proposed 2022 RTP/SCS would be consistent with individual jurisdiction General Plans and specific modal Transportation Plans, as well as the goals and objectives included in the 2018 RTP/SCS and the proposed 2022 RTP/SCS.

Since the proposed 2022 RTP/SCS would result in additional and improved facilities to accommodate pedestrian, bicycle, and transit travel modes, there would not be substantial disruption of bicycle, pedestrian, and transit facilities. In addition, the proposed 2022 RTP/SCS would result in roadway capacity increases, congestion relief, safety improvements, and overall circulation improvements. Therefore, the proposed 2022 RTP/SCS would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. This impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

Threshold 2:	The project would conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b), specifically resulting in a. An overall increase in total regional VMT above baseline (2016) conditions would be considered a significant impact; b. A change in VMT per capita in the region that fails to reach 16 percent below baseline (2020) VMT per capita conditions would be considered a significant impact; or c. A substantial increase in induced travel due to roadway capacity expansions would be considered a significant impact.

Impact T-2 THE PROPOSED 2022 WOULD RESULT IN AN OVERALL INCREASE IN REGIONAL VMT ABOVE BASELINE (2016) CONDITIONS. THE PROPOSED 2022 RTP/SCS WOULD RESULT IN AN INCREASE IN VMT PER CAPITA BELOW THE ABOVE BASELINE (2016) CONDITIONS. REGIONAL VMT AND VMT PER CAPITA IMPACTS FROM IMPLEMENTATION OF THE PROPOSED 2022 RTP/SCS WOULD BE SIGNIFICANT AND UNAVOIDABLE. THE INDUCED TRAVEL IMPACT AT THE REGIONAL LEVEL WOULD BE LESS THAN SIGNIFICANT.

Table 4.14-2, below, compares the total daily regional VMT and VMT per capita for baseline conditions in 2016 and for anticipated 2046 conditions with implementation of the proposed 2022 RTP/SCS on all roadways for the SJCOG region as a whole. The daily VMT and VMT per capita anticipated in 2046 without implementation of the proposed 2022 RTP/SCS are also provided in Table 4.14-2 for informational and comparative purposes.

Overall Increase in Regional VMT

The SJCOG Model used to estimate VMT includes the regional transportation system elements shown in Table 4.14-2. Regional VMT data accounts for automobiles and light duty trucks, as well as all travel within the region, including trips that originate or end outside of the SJCOG region. An area's VMT per capita is the total VMT divided by the population of that area and is a measure of the average vehicle miles each person travels on a typical weekday.

Table 4.14-2 VMT Results Summary

Scenario	2016	2046 Plan	2046 No Build
Base VMT (SJCOG Model)	17,015,116	23,495,442	23,684,122
Induced VMT (Hybrid NCST)	N/A	1,732,137	463,370
Total VMT	**17,015,116**	**25,227,579**	**24,147,492**

Source: SJCOG Modelling Information

As shown in Table 4.14-2,Base VMT reflects the portion of VMT results directly output by the SJCOG regional model. This includes VMT resulting from existing and projected growth, multiple "short term" effects including diversion to new or expanded roadways, mode shifts, longer trip lengths and other short-term travel pattern shifts resulting from changes in accessibility. Conversely, the induced VMT increment was determined using the California Induced Demand Calculator and reflects the long-term induced effect that changes in accessibility (i.e., new or widened roadways) have on employment and residential location choices. Additional information on induced demand is included in the "Induced Travel" section.

As shown, the proposed 2022 RTP/SCS is projected to increase the total regional VMT above 2016 baseline conditions. Including induced travel as shown in Table 4.14-2, with implementation of the 2022 RTP/SCS, total daily regional VMT would increase by an estimated 8,212,463 miles in 2046, which would be an approximately 48 percent increase from the baseline 2016 conditions for 2046. Therefore, this impact would be significant.

For informational purposes, Table 4.14-2 shows that total regional VMT would also increase without implementation of the proposed 2022 RTP/SCS. Specifically, total daily regional VMT would increase by an estimated 6,669,006 miles from baseline for 2046 without implementation of the proposed 2022 RTP/SCS, which would be an approximately 24 percent increase. This demonstrates that population growth in the SJCOG region would increase daily VMT, regardless of implementation of the proposed 2022 RTP/SCS. Note, however, that the modelled VMT under the 2046 plan would be lower than that of the no build scenario. As this VMT increase is higher than the 2016 baseline, the impact is significant.

Per Capita Vehicle Miles Traveled

Table 4.15-3 VMT Results Summary

Scenario	Regional VMT	VMT per Capita[1]
2016 Baseline	17,015,116	23.24
2046 with proposed 2022 RTP/SCS	25,227,579	25.37
2046 without proposed 2022 RTP/SCS	24,147,492	24.29

Source: Appendix A
[1] VMT per capita is based on a 2016 population size of 732,185 persons, and an interpolated 2046 population size of 994,257 persons.

Daily VMT per capita including induced demand would increase from 23.24 to 25.37 miles by 2046 with implementation of the proposed 2022 RTP/SCS, an increase of approximately 9.17 percent. For informational purposes, Table 4.14-2 also shows that without implementation of the proposed 2022 RTP/SCS, daily VMT per capita would increase from 23.24 to 24.29 by 2046. This would be an increase of approximately 4.50 percent for 2046. As shown, the proposed 2022 RTP/SCS would fail to reach 16 percent below baseline (2016) VMT per capita conditions in 2046. Therefore, this impact would be significant.

Induced Travel

It should be noted that although this is a program-level analysis, and not project specific, some of the proposed 2022 RTP/SCS projects include expanding the capacity of State highways in the region. These include adding travel lanes (managed lanes) on I-205, SR 120, and I-5. Other proposed 2022 RTP/SCS projects include expanding the capacity of major arterials in various locations in the county.

Numerous studies and research suggest that an expansion of highway capacity may induce travel (OPR 2018) According to OPR, the initial reduction in traffic congestion and travel times from increased capacity is attractive to travelers, resulting in more trips on the facility and increasing the total VMT. These types of projects may result in the following trip-making changes, which have implications for total VMT (OPR 2018):

- Longer Trips. The ability to travel a long distance in a shorter time increases the attractiveness of destinations that are further away, increasing trip length and VMT.

- Changes in Mode Choice. When transportation investments are devoted to reducing automobile travel time, travelers tend to shift toward automobile use from other modes, which increases VMT.
- Route Changes. Faster travel times on a route attract more drivers to that route from other routes, which can increase or decrease VMT depending on whether it shortens or lengthens trips.
- Newly Generated Trips. Increasing travel speeds can induce additional trips, which increases VMT. For example, an individual who previously telecommuted or purchased goods on the internet might choose to accomplish those ends via automobile trips as a result of increased speeds.
- Land Use Changes. Faster travel times along a corridor lead to land development further along that corridor; that development generates and attracts longer trips, which increases VMT. Over several years, this component of induced VMT can be substantial, e.g., approximately half of the total effect on VMT.

Regarding land use changes, the proposed 2022 RTP/SCS coordinates land use and transportation projects through the 2046 horizon year. The SCS identifies a land use strategy that supports the objectives of SB 375 to achieve, among other things: increased roadway optimization, increased modes of travel other than single occupancy automobiles, increased access to jobs and amenities, minimized increases in VMT and reduced GHG emissions. Among the strategies to meet these goals is a mix of land uses balanced to minimize VMT and maximize the ability for residents and visitors of the region to conduct everyday activities without the need to travel by car. As a consequence, the transportation system performance results discussed in the EIR's transportation impact analysis capture the effects of land use changes on overall travel demand in the region.

Given the suburban and rural nature of San Joaquin County, without suppression, induced vehicle travel effects of roadway expansion projects will be substantially dampened. Although the SJCOG Model does not specifically evaluate induced travel from the perspective of longer trips, changes in mode choice, route changes or newly generated induced trips, at the regional level these effects may also be negligible compared to the overall amount of travel. As discussed in the Federal Highway Administration's "HERS-ST Highway Economic Requirements System - State Version: Technical Report - Appendix B: Induced Traffic and Induced Demand" (2002), "If the demand is for a single facility, then induced traffic will appear large relative to previous volumes, because most of the change in trips will be from diverted trips. At the regional level, induced traffic would be a smaller share of total traffic growth, because only trips diverted from other regions, plus substitutions between transportation and other goods, make up the induced share." Therefore, although individual capacity-increasing roadway projects included in the proposed 2022 RTP/SCS may induce travel, at the regional level additional VMT resulting specifically from induced travel demand would not be substantial, and the induced travel impact at the regional level would be less than significant.

The following mitigation measures would reduce regional VMT and VMT per capita impacts.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures developed for the proposed 2022 RTP/SCS where applicable for transportation projects. For land use projects under their jurisdiction, the County and incorporated cities in the SJCOG region can and should

implement the following mitigation measures. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site specific conditions.

T-2(a) Regional VMT Reduction Programs

Implementing agencies shall require implementation of VMT reduction strategies through TDM programs, impact fee programs, mitigation banks or exchange programs, in-lieu fee programs, and other land use project conditions that reduce VMT. Programs shall be designed to reduce VMT from existing land uses, where feasible, and from new discretionary residential or employment land use projects. The design of programs and project specific mitigation shall focus on VMT reduction strategies that increase travel choices and improve the comfort and convenience of sharing rides in private vehicles, using public transit, biking, or walking. Modifications may include but are not limited to:

- Provide car-sharing, vanpool, bike sharing, and ride-sharing programs
- Implement or provide access to commute reduction programs, such as the measures included in Rule 9410 adopted by the San Joaquin Valley Air Pollution Control District
- Provide a bus rapid transit system, such as the planned Modesto BRT
- Improve pedestrian or bicycle networks or transit service, such as the planned ACE Forward passenger rail service extension
- Provide transit passes
- Provide a van pool program, such as CalVans
- Encourage telecommute programs
- Incorporate affordable housing into the project
- Increase density
- Increase mixed uses within the project area
- Incorporate improved pedestrian connections within the project/neighborhood
- Incentivize development in low VMT communities
- Incentivize housing near commercial and offices
- Increase access to goods and services, such as groceries, schools, and daycare
- Incorporate neighborhood electric vehicle network and incentivize the installation of electric vehicle chargers in places such as shopping and employment centers
- Orient the project toward transit, bicycle, and pedestrian facilities
- Provide traffic calming
- Provide bicycle parking
- Limit parking
- Separate out parking costs
- Provide parking cash-out programs
- Provide incentives to purchase electric vehicles
- Construct intelligent transportation system management/intelligent transportation system (TSM/ITS) measures such as ramp metering, signalization of intersections, and changeable message signs
- Provide a VMT mitigation bank or exchange program

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and counties. This mitigation measure shall, or can and should, be applied during project permitting and environmental review and implemented during project operation, as applicable.

Significance After Mitigation

If implementing agencies adopt and require the mitigation measures outlined above, impacts would be reduced because less VMT would be added to the SJCOG region. As discussed above, while VMT on certain routes looks high, this is largely attributable to the model's diverted trips, and not a reflection of an increase in regional VMT. Therefore, the plan's impact on regional VMT is less than significant. However, at the local level, the implementation of project-level VMT-reducing measures, such as mixed uses, transit-oriented development, or participation in a VMT Mitigation Banks other fee-based VMT mitigation program may not be feasible or may not be able to fully mitigate an individual project's impact. Therefore, this impact would remain significant and unavoidable. No additional mitigation measures to reduce this impact to less than significant levels are feasible.

Threshold 3:	The Project would substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)

Impact T-3 TRANSPORTATION AND LAND USE PROJECTS IMPLEMENTED UNDER THE PROPOSED 2022 RTP/SCS WOULD NOT SUBSTANTIALLY INCREASE HAZARDS DUE TO GEOMETRIC DESIGN FEATURES OR INCOMPATIBLE USES. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

The regional growth pattern of the proposed 2022 RTP/SCS does not define design level features of roadways. While the proposed 2022 RTP/SCS expands development and increases density in growth geographies, this growth would not impact geometric design features or roadway uses in a consistent way, as those design standards and uses are established and enforced at the local jurisdictional level. Specific transportation projects identified in the proposed 2022 RTP/SCS consist of widening existing roadways; constructing expressways and freeways; and installing medians, all of which would result in improved circulation and safety. Future transportation projects would also be subject to design guidelines established by the State or the local jurisdiction with authority over the project, including curve radii on curving road segments, maximum road grade/slope, and minimum separating distance between intersections and driveways.

Construction activities resulting from implementation of the proposed 2022 RTP/SCS would be short term, intermittent, and geographically dispersed. At the regional level, these disruptions would be localized, and impacts would be limited and would not represent a significant impact to the operations of the regional transportation system. At the local level, construction activities could increase travel on local roads and result in detours or increased congestion in certain locations. The actual construction details of land use development projects and proposed transportation projects are not known, because the projects are in the early stages of planning. Construction impacts would be evaluated at the project level as more information about the timing, design, scope, and construction program are available. Generally, construction activities for land use development and transportation projects would be required to be conducted in accordance with, and subject to review by, all applicable State and/or local jurisdictions with authority over the project; thus,

ensuring projects would be designed to minimize the potential for hazardous conditions and to ensure safe travel by all modes.

Future transportation projects would be required to conform to the design standards of the public agency responsible for implementation, including safety standards. As such, the proposed 2022 RTP/SCS is would not negatively impact the design of transportation facilities by increasing hazards. Rather, investments would incentivize design improvements to make roadways safer. Therefore, the proposed 2022 RTP/SCS would not substantially increase hazards due to geometric design features or incompatible land uses, and the impact would be less than significant.

Similarly, the proposed SJCOG 2022 RTP/SCS would not adversely impact the compatible use of transportation facilities. Rather, investments would incentivize design improvements to make roadways safer. The SCS does not introduce new agricultural uses or other similar uses that would result in increased incompatible vehicle uses on roadways in the region, such as slow-moving farm equipment. In addition, specific transportation projects under the proposed 2022 RTP/SCS would be subject to and would follow the allowable uses established by the State or the local jurisdiction with authority over the project. Therefore, the proposed 2022 RTP/SCS would not substantially increase hazards due to incompatible uses.

Furthermore, the 2022 RTP/SCS does not include components that would result in changes in air traffic patterns that would result in substantial safety risks. To minimize any unanticipated safety risks, any development and subsequent planning decisions in proximity to airports would be subject to review under the State Aeronautics Act provided under Public Utilities Code §§ 21167 et seq. Specific projects that may affect navigable airspace are also subject to FAA review, as outlined under 14 CFR Parts 77.5, 77.7 and 77.9.

Overall, this impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

Threshold 4:	The project would result in inadequate emergency access
Threshold 5:	The project would impair implementation or physically interfere with an adopted emergency response plan or emergency evacuation plan

Impact T-4 TRANSPORTATION AND LAND USE PROJECTS IMPLEMENTED UNDER THE PROPOSED 2022 RTP/SCS WOULD NOT RESULT IN INADEQUATE EMERGENCY VEHICLE ACCESS, NOR WOULD PROJECTS IMPLEMENTED UNDER THE PROPOSED 2022 RTP/SCS IMPAIR IMPLEMENTATION OR PHYSICALLY INTERFERE WITH AN ADOPTED EMERGENCY RESPONSE PLAN OR EMERGENCY EVACUATION PLAN. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

Transportation infrastructure plays a key role in providing access to destinations during emergencies. These systems must be able to accommodate emergency response vehicles, personnel, and equipment. In the event of an emergency or disaster, the SJCOG region's roads and other transportation networks can determine the success or failure of the region during the emergency and in recovery. The proposed 2022 RTP/SCS would not implement specific design features or specifications for new project-level development or other transportation facilities. However, the specific projects and programs identified in the proposed 2022 RTP/SCS would entail upgrades and improvements to existing transportation infrastructure, resulting in increased roadway capacity, congestion relief, circulation improvements, and overall roadway safety

improvements. As such, implementation of the proposed 2022 RTP/SCS would improve performance of the transportation system in the SJCOG region, which would improve emergency response and facilitate more effective emergency evacuation.

The actual design details of land use development projects and proposed transportation projects are not known, because the projects are in the early stages of planning. However, both Caltrans and local jurisdictions have design standards for new and existing development and roadways to ensure adequate passage of emergency vehicles. Standards include specifications related to clear width, effective turning radius and turnouts, curve radii on curving road segments, maximum road grade/slope, and minimum separating distance between intersections and driveways. Transportation projects would be subject to review with regard to emergency vehicle requirements by State and/or local jurisdictions with authority over the project as well as responsible emergency service agencies; thus, ensuring projects would be designed to meet all applicable emergency design standards.

Construction activities could temporarily impair emergency access points used for emergency vehicle access. However, standard construction procedures for development of a construction management plan would address these conditions and would require provision of alternative emergency vehicle access points. Specifically, in accordance with Caltrans permitting requirements, a traffic control plan would be required that adheres to the standards set forth in the California Manual of Uniform Traffic Control Devices (Caltrans 2014). As part of these requirements, there are provisions for coordination with local emergency services, training for flagmen for emergency vehicles traveling through the work zone, temporary lane separators that have sloping sides to facilitate crossover by emergency vehicles, and vehicle storage and staging areas for emergency vehicles. The Caltrans requirements also provide for construction work during off-peak hours and flaggers and include provisions for "Detour for Bike Lanes on Roads with Closure of One Travel Direction." Measures similar to Caltrans requirements are typically applied to local projects, such as requiring at least two points of ingress/egress to residential developments for emergency access.

In addition, while implementation of proposed 2022 RTP/SCS's land use scenario and transportation projects could temporarily impede emergency access at project locations during construction periods, construction projects would conform to State, regional, and local regulations requiring maintenance of emergency access during construction. Based on the above analysis, the impacts of the proposed 2022 RTP/SCS on emergency vehicle access and on interference with an adopted emergency response plan or emergency evacuation plan would be less than significant.

Mitigation Measures

No mitigation measures are required.

c. Specific Proposed 2022 RTP/SCS Projects That May Result in Impacts

The analysis within this section discusses the transportation impacts associated with the transportation improvement projects included in the proposed 2022 RTP/SCS. The projects within the proposed 2022 RTP/SCS are evaluated herein in their entirety and are intended to improve circulation rather than cause adverse impacts. However, as described above, the proposed 2022 RTP/SCS would increase baseline 2016 regional VMT by approximately 8,212,463 miles in 2046, which would be an approximately 48 percent increase from the baseline 2016 conditions for 2046. This effect has been found to be a significant and unavoidable impact, as described above. The SJCOG Model used for this analysis does not have the capability to distinguish which project or projects would specifically result in increased regional VMT. However, any number of the proposed

2022 RTP/SCS projects that expand roadway capacity or improve traffic flow and circulation could presumably increase VMT. Thus, there are no specific transportation projects that can be listed in this section related to the adverse impacts of increased regional VMT in the SJCOG region.

4.14.4 Cumulative Impacts

The cumulative impacts analysis area for transportation consists of the SJCOG region and the seven adjoining counties. Movement within, through, and beyond the SJCOG region is necessary for commuters, personal travel, and goods movement. Thus, it is important to consider both the SJCOG region as well as the connection with the adjoining counties.

The federal, State, and regional laws, regulations, and policies outlined in Section 4.14.2, *Regulatory Setting,* apply to surrounding counties in the same manner as they apply to projects within the SJCOG region, thereby avoiding the potential for cumulative conflict between the transportation planning for the SJCOG region and the surrounding counties. Therefore, the potential cumulative impacts resulting from the implementation of the proposed 2022 RTP/SCS related to conflict with programs, plans, and ordinances or policies addressing the circulation system would be less than significant, and the proposed 2022 RTP/SCS contribution would not be cumulatively considerable.

Development in the cumulative impact analysis area would result in significant and unavoidable increase in regional VMT as well as daily VMT per capita from baseline (2016) conditions, partially due to commuters travelling to and from employment in the adjoining counties. However, the 2022 RTP/SCS is designed to maintain and foster the balance between jobs and housing within the SJCOG region and provides a strategy to allocate growth in such a way as to achieve a more balanced jobs/housing ratio and to optimize transportation investments that support those land uses.

As discussed above, implementation of the 2022 RTP/SCS would increase daily VMT in 2046 compared to the baseline 2016 conditions While the majority of the VMT would be expected to remain within the SJCOG region, some portion of the VMT would inevitably extend to areas within the adjoining counties. The most reasonable assumption is that VMT to adjoining counties would be concentrated to the most heavily traveled roadways in the counties with the highest relative employment, such as I-5 and SR-99 into Sacramento and Stanislaus counties The increased VMT in adjoining county areas would be in addition to the VMT generated from the increased population growth of such counties into the future. Per capita VMT in the cumulative impact area would be unlikely to reach 16 percent below the baseline VMT per capita by 2046 due to increased VMT in the region, both with and without implementation of the proposed 2022 RTP/SCS. The implementation of project-level VMT-reducing measures, such as mixed uses and transit-oriented development, may not be feasible and cannot be guaranteed on a project-by-project basis. Regional VMT reduction programs, such as VMT banks, may also not be feasible as there are no procedures or policies in place to establish such programs. Thus, cumulative impacts on VMT would be significant and the proposed 2022 RTP/SCS contribution to cumulative VMT impacts would be cumulatively considerable, and this contribution would remain cumulatively considerable post-mitigation.

Some types of transportation impacts are related to site- and project-specific characteristics and conditions and would not be significantly affected by other development outside of the SJCOG region. As discussed in Impacts T-3 and T-4, there are existing federal, State, and local regulations that govern transportation hazards and emergency access associated with development and infrastructure projects. Regulations and oversight, as outlined in the impact analysis above, would effectively reduce the potential for individual projects to create a transportation hazards or emergency access impact within the SJCOG region and surrounding counties. Thus, cumulative

impacts related to the transportation hazards and emergency access would not be significant and the proposed 2022 RTP/SCS contribution would not be cumulatively considerable.

4.15 Tribal Cultural Resources

This section evaluates potential impacts to tribal cultural resources from development facilitated by the proposed 2022 RTP/SCS.

4.15.1 Setting

a. Ethnographic Context

The SJCOG region is centrally located between the Sacramento and San Joaquin Valleys in the Delta and Eastside Streams region of California (USGS 2021). The area was primarily inhabited by two aboriginal California Native American groups: the Plains Miwok and the Northern Valley Yokuts.

Plains Miwok

Most of the SJCOG region is located in the traditional tribal territory of the Plains Miwok, members of the larger Miwokan subgroup of the Utian language family inhabiting an area along the lower reaches of the Mokelumne and Cosumnes rivers and both banks of the Sacramento River roughly from Rio Vista north to Freeport (Levy 1977). Plains Miwok subsistence practices centered on the use of acorns and of seeds as primary plant food sources and on hunting of mule deer, tule elk, pronghorn antelope, and various species of waterfowl. Hunting was typically done with a sinew-backed bow and arrow. Fishing was a particularly important activity for the Plains Miwok, primarily with various types of nets. Seines were used in large rivers and sloughs where the pace of water flow was slow Hook and line was typically used to take sturgeon, while harpoons were the most common implement for salmon fishing (Levy 1977).

The Plains Miwok made both twined and coiled basketry, usually from will and redbud. They also manufactured tule mats used as floor covering. Woven blankets were often made of rabbit skin strips or feathers attached to cordage woven from plant fibers. Tule balsa rafts were crafted and used to navigate rivers and sloughs (Levy 1977).

Plains Miwok settlements typically included thatched, conical houses and semisubterranean earth-covered dwellings in winter, constructed by higher-status families. Houses generally had a central hearth and an earth oven for cooking purposes. Large, semisubterranean assembly houses were constructed for use as a ritual and social gathering place. In summer, a circular brush hut was constructed for use in mourning ceremonies. Other structures included sweathouses for curing disease and purification prior to hunting, small conical structures used by menstruating women, and grinding houses built over bedrock mortars to permit food processing in inclement weather. Acorn granaries were constructed for long-term acorn storage (Levy 1977).

Political organization centered on small tribelets of approximately 300 to 500 people and several distinct settlements. Each tribelet was headed by a chief, and each settlement had a representative of the chief overseeing local affairs. Chiefs acted as advisors and managed use of natural resources by preventing trespassing on tribelet territory and determining the appropriate time to begin acorn harvest each season. The chief also arbitrated any disputes and sanctioned the punishment of criminal offenders.

Miwok social organization followed the moiety pattern, with all living things belonging to one of two categories: land and water. Moieties were typically exogamous and played an important role in many ceremonies (Levy 1977).

Northern Valley Yokut

The southern portion of the SJCOG region is located at the very northern end of the San Joaquin Valley, an area historically occupied by the Penutian-speaking Yokuts (Kroeber 1925, Wallace 1978, Latta 1999). Three geographical divisions of the Yokuts are the Northern Valley, Southern Valley, and Foothill Yokuts. The distinction between the three groups is primarily based on language dialect (Mithun 2001).

The Yokuts established large permanent village settlements, or closely associated smaller settlements, such as the Tulamniu village. Residential structures were most often of two types: single-family dwellings and larger communal residences that housed ten families or more. Villages frequently included mat-covered granaries and a sweathouse (Mithun 2001; Sutton et al. 2016).

The basic economic unit among the Yokuts was the nuclear family. The nuclear family was linked to totemic lineages based on patrilineal descent. Totem symbols were passed from father to offspring. Families that shared the same totem formed an exogamous lineage. Totems were associated with one of two moieties. This moiety division played a role during ceremonies and other social events (Wallace 1978).

Yokuts were split into self-governing local groups that included several villages. Each group had a chief who directed ceremonies, mediated disputes, handled punishment of those doing wrong, hosted visitors, and provided aid to the impoverished. In certain cases, settlements had two chiefs, one for each moiety. Other political positions included the chief's messenger and the spokesman (Wallace 1978).

Shamans were an important part of Yokut village life. A Yokut Shaman gained power through a dream or vision. If, after this vision, the man accepted the role as shaman, he would pray, fast, and acquire talismans to aid him in his future work. Shamans had the ability to heal the sick and served a primary role in religious life (Wallace 1978).

Yokuts subsistence strategy was based on a mixed economy focused on fishing, collecting, and hunting small game. Fishermen employed tule rafts and caught fish with nets, spears, basket traps, and bow and arrow. They often gathered mussels and hunted turtles in lakes, rivers, and streams. Wild seeds and roots contributed a large portion to the Yokuts diet. Tule roots were gathered, dried, and pounded into a flour which was prepared as a mush. Tule seeds and grass and flowering herb seeds were prepared in the same way. Leaves and stems of certain plants, such as clover and fiddle-neck, were also collected. Acorns, a staple of most California Native Americans, were not readily available in the ethnographic territory of the Yokuts. Some Yokuts tribes traded for acorns with neighboring groups, such as the Salinan and Chumash to the west, the Foothill Yokuts to the east, and the Kawaiisu and Kitanemuk to the southeast (Kroeber 1925). Waterfowl was frequently hunted with snares, nets, and bow and arrow. Land mammals and birds contributed a smaller part of the Yokuts diet. Small game was occasionally taken in snares or traps or shot with bows and arrows (Wallace 1978; Sutton et al. 2016).

Yokuts technology depended primarily on tule. Stems of the plant served as the raw material for baskets, cradles, boats, housing, and many other items. Manos and metate were used to process food and animal hides (Sutton et al. 2016). Tools such as knives, projectile points, and scraping tools were made from imported lithic materials because stone was not readily available in the Central Valley. Some tools, such as bead drills, could be made from local obsidian (Sutton et al. 2016). Marine shells secured through trade with coastal groups were used as shell money and personal adornment items, such as Olivella beads (Sutton et al. 2016; Wallace 1978).

b. Tribal Cultural Resources

Tribal cultural resources that could be present within the SJCOG region include but are not limited to Native American burial sites, village or occupation sites, traditional resource gathering locations and natural landforms such as mountain peaks, ridge tops, or rivers. Such resources are present throughout the SJCOG region, including known and documented sites as well as undocumented sites that will be identified through cultural resources survey or ground disturbance. Tribal cultural resources are likely to be encountered near areas of prior Native American occupation and activity, which includes areas both within and outside of areas of current development. Surficial archaeological deposits that are tribal cultural resources are more likely to be heavily disturbed within urban areas and more intact in rural settings; however, this does not preclude the presence of buried archaeological resources that may be significant in urban settings.

4.15.2 Regulatory Setting

a. Federal Laws, Regulations, and Policies

The Department of Transportation Act

Passed in 1966, the Department of Transportation Act (49 United States Code 303, formerly 49 United States Code 1651(b)(2) and 49 United States Code 1653(f) includes Section 4(f), which states that the Federal Highway Administration and other U.S. Department of Transportation agencies cannot approve the use of land from public and private historical sites unless certain conditions apply. These conditions are the following: If there is no feasible and prudent avoidance alternative to the use of land, and if the action includes all possible planning to minimize harm to the property resulting from such use; or if the Federal Highway Administration determines the use of the property will have a *de minimis* impact.

Archaeological Resources Protection Act of 1979 (ARPA)

This statute was enacted to protect archaeological resources and sites that are on public lands and tribal lands, to foster increased cooperation and exchange of information between government representatives, the professional archaeological community, and private individuals. Section 4 of the statute and Sections 16.5-16.12 of the uniform regulations describe the requirements that must be met before federal authorities can issue a permit to excavate or remove any archaeological resource on federal or tribal lands. The curation requirements of artifacts, other materials excavated or removed, and the records related to the artifacts and materials are described in Section 5 of the ARPA. This section also authorizes the Secretary of the Interior to issue regulations describing in more detail the requirements regarding these collections.

American Indian Religious Freedom Act of 1978

The American Indian Religious Freedom Act of 1978 (AIRFA) (42 U.S. Code Section 1996) pledges to protect and preserve the traditional religious rights of American Indians, Aleuts, Eskimos, and Native Hawaiians. It establishes a national policy that traditional Native American practices and beliefs, sites (and right of access to those sites), and the use of sacred objects shall be protected and preserved. If a place of religious importance to American Indians could be affected by a federal undertaking, AIRFA promotes consultation with Indian religious practitioners, which could be coordinated with Section 106 consultation. Amendments to Section 106 of the NHPA in 1992 strengthened the interface between AIRFA and the NHPA by clarifying the following: (1) properties

of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization could be determined to be eligible for inclusion in the NRHP; and (2) in carrying out its responsibilities under Section 106, a federal agency shall consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to properties described under (1).

Archeological Resources Protection Act of 1979

The Archeological Resources Protection Act of 1979 (ARPA) (43 CFR Section 7) establishes uniform definitions, standards, and procedures to be followed by all federal land managers in providing protection for archaeological resources located on public lands and Native American lands. Under ARPA, additional requirements could apply to agency action if federal or Indian lands are involved. ARPA (1) prohibits unauthorized excavation on federal and Indian lands, (2) establishes standards for permissible excavation, (3) prescribes civil and criminal penalties, (4) requires agencies to identify archeological sites, and (5) encourages cooperation between federal agencies and private individuals.

Native American Graves Protection and Repatriation Act of 1990

The intent of the Native American Graves Protection and Repatriation Act of 1990 (25 U.S. Code Section 3001) is to identify Native American affiliation or lineal descent and ensure the rightful disposition, or repatriation, of Native American human remains, funerary objects, sacred objects, and items of cultural patrimony that are in federal possession or control. The regulations implementing the requirements of Native American Graves Protection and Repatriation Act relating to the inadvertent discovery of human remains and objects of cultural patrimony of Native American origin on federal or tribal lands are described in 43 CFR Section 10.4.

b. State Laws, Regulations, and Policies

Assembly Bill 52

AB 52 expanded CEQA by defining a new resource category, “tribal cultural resources.” AB 52 establishes that “a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment” (Public Resources Code [PRC] Section 21084.2). AB 52 further states when feasible, the lead agency shall establish measures to avoid impacts that would alter the significant characteristics of a tribal cultural resource (PRC Section 21084.3). PRC Section 21074 (a)(1)(A) and (B) defines tribal cultural resources as “sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe,” and meets either of the following criteria:

a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC Section 5020.1(k).
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 PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

AB 52 also establishes a formal consultation process for California tribes regarding those resources. The consultation process must be completed before a CEQA document can be certified or adopted.

AB 52 requires that lead agencies "begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project." Native American tribes to be included in the process are those that have requested notice of projects proposed in the jurisdiction of the lead agency.

AB 52 (PRC Section 21084.3(b)) describes mitigation measures that may avoid or minimize the significant adverse impacts to TCRs. Examples include:

(1) Avoiding and preserving the resources in place, including, but not limited to, planning and constructing to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria

(2) Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

(A) protecting the cultural character and integrity of the resource

(B) protecting the traditional use of the resource

(C)protecting the confidentiality of the resource

(3) Establishing permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places

(4) Protecting the resource

SJCOG has conducted AB 52 consultation as the lead agency for implementation of the 2022 RTP/SCS. SJCOG sent letters on June 25, 2021 to eleven Native American organizations (Buena Vista Rancheria of Me-Wuk Indians, Chicken Ranch Rancheria of Me-Wuk Indians, Guidiville Indian Rancheria, Muwekma Ohlone Tribe of the SF Bay Area, Nashville Enterprise Miwok-Maidu-Nishinam Tribe, Northern Valley Yokuts Tribe, Wuksache Indian Tribe/Eshom Valley Band, Tule River Indian Tribe, United Auburn Indian Community of the Auburn Rancheria, Wilton Rancheria, and The Confederated Villages of Lisjan) who had previously requested formal notice to consult. No responses have been received as of the date of this EIR.

4.15.3 Impact Analysis

a. Methodology and Significance Thresholds

In accordance with the requirements of AB 52, SJCOG conducted AB 52 consultation for the proposed 2022 RTP/SCS, which consisted of written communication with the: Big Sandy Rancheria of Western Mono Indians, Dunlap Band of Mono Indians, Wuksache Indian Tribe/Eshom Valley Band, Kern Valley Indian Community, Santa Rosa Rancheria Tachi Yokut Tribe, Tubatulabals of Kern Valley, and Tule River Indian Tribe. No response was received. Therefore, AB 52 consultation has concluded.

Appendix G of the State CEQA Guidelines identifies the following criteria for determining whether a project's impacts would have a significant impact to tribal cultural resources:

1. 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:

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

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.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with projects contained within the 2022 RTP/SCS. Section 4.13.3.c summarizes the impacts associated with capital improvement projects proposed in the 2022 RTP/SCS. Due to the programmatic nature of 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1:	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: 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 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.

Impact TCR-1 IMPLEMENTATION OF PROPOSED TRANSPORTATION IMPROVEMENTS AND FUTURE PROJECTS INCLUDED IN THE LAND USE SCENARIO ENVISIONED IN THE 2022 RTP/SCS HAS THE POTENTIAL TO IMPACT TRIBAL CULTURAL RESOURCES. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED.

AB 52 Consultation has closed for this project as no tribes responded to the AB 52 notification during the consultation process. Tribal cultural resources are very likely present throughout the SJCOG region. These may include, but are not limited to, Native American burial sites, village or occupation sites, traditional resource gathering locations, and natural landforms. Therefore, tribal cultural resources could be encountered during implementation of the transportation improvement projects included in the 2022 RTP/SCS and the land use scenario envisioned by the 2022 RTP/SCS. Effects on tribal cultural resources are highly dependent on the individual project site conditions and the characteristics of a project. Impacts to tribal cultural resources may include damage or

destruction of the resources. Adherence to the requirements of AB 52 encourages tribal consultation with local Native Americans and requires the identification of project-specific substantial adverse effects on tribal cultural resources and appropriate project-specific mitigation measures. If the transportation project sponsor agencies determine that a specific transportation or land use project could cause a substantial adverse change in the significance of a tribal cultural resource, the impact would be potentially significant.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, in addition to CR-2 (a, b), the following mitigation measures for applicable transportation projects that would result in tribal cultural resource impacts, and where feasible and necessary based on site-specific considerations. San Joaquin County and incorporated cities in the County should implement these measures, where relevant to land use projects implementing the 2022 RTP/SCS. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site specific conditions.

TCR-1(a) Identified Tribal Cultural Resources Impact Minimization

Implementing agencies shall, or can and should, comply with AB 52, which may require formal tribal consultation. If the implementing agency determines that a project may cause a substantial adverse change to a tribal cultural resource, they shall implement mitigation measures identified in the consultation process required under PRC Section 21080.3.2, or shall implement the following measures where feasible to avoid or minimize the project-specific significant adverse impacts:

- Avoidance and preservation of the resources in place, including, but not limited to: designing and building the project to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space to incorporate the resources with culturally appropriate protection and management criteria.
- Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
  - Protecting the cultural character and integrity of the resource
  - Protecting the traditional use of the resource
  - Protecting the confidentiality of the resource
- Establishment of permanent conservation easements or other culturally appropriate property management criteria for the purposes of preserving or utilizing the resources or places.
- Native American monitoring by the appropriate tribe during soil disturbance for all projects in areas identified as sensitive for potential tribal cultural resources and/or in the vicinity (within 100 feet) of known tribal cultural resources.

TCR-1(b) Unanticipated Tribal Cultural Resources Impact Minimization

If unanticipated potential tribal cultural resources are encountered during ground-disturbing activities, work in the immediate area must halt and the appropriate tribal representative(s), the implementing agency, and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service [NPS] 1983) shall be contacted immediately to evaluate the find. If, in consultation with the implementing agency, the

archaeologist and/or tribal representative determines the discovery to be a tribal cultural resource and thus, significant under CEQA, a mitigation plan shall be prepared and implemented in accordance with state guidelines and in consultation with tribal representatives. If the resource cannot be avoided, a mitigation plan shall be developed to address tribal concerns.

Implementing Agencies and Timing

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. These mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate.

Significance After Mitigation

Mitigation Measure TCR-1(a) would require implementation of mitigation identified through tribal consultation or other feasible mitigation to avoid impacts to identified tribal cultural resources. These measures would protect the resource's character, traditional use, and confidentiality. Mitigation Measure TCR-1(b) would ensure that impacts to unanticipated tribal cultural resources activities would be mitigated in consultation with tribal representatives. Implementation of the above measures would reduce impacts to tribal cultural resources to a less than significant level.

c. Specific RTP/SCS Projects that May Result in Impacts

All 2022 RTP/SCS projects that require construction may result in impacts to tribal cultural resources and, therefore, are not specifically identified in table format below. All 2022 RTP/SCS transportation projects that require ground disturbance outside of existing right-of-way may result in impacts discussed in Impact TCR-1, such as those listed in Table 2-1 in Section 2, *Project Description*. Additional analyses and AB 52 consultation with local tribes would be needed as the individual projects are implemented to determine the project-specific impact. The mitigation measures discussed above and potentially others requested by tribal representatives on a project-by-project basis would apply to these specific projects.

4.15.4 Cumulative Impacts

The cumulative impact analysis area for tribal cultural resources consists of the SJCOG region and adjoining counties. Information regarding these adjoining counties can be found in Section 3.1 – Environmental Setting, Table 3-1. Future development in this region that could impact cultural resources is considered in the analysis. This cumulative extent is used to evaluate potential direct and indirect, and permanent and temporary impacts to tribal cultural resources within the context of regional diminishment of these resources.

Tribal cultural resources are regionally specific and determined by the local tribes. However, development in the cumulative impact analysis area would increasingly extend into previously undeveloped areas. The SJCOG region would continue to develop under the SCS and could result in expansion of urban areas into undeveloped land and that development could encourage development in adjoining counties that have the potential to impact tribal cultural resources. Tribal cultural resources are often associated with areas near water, such as rivers, because Native American Tribes congregated near water. The increase in growth in previously undisturbed areas would contribute to regional impacts on tribal cultural resources.

Development in the SJCOG area would increase under the 2022 RTP/SCS by increasing mobility and growth. The increase in growth in previously undisturbed areas contributes to regional impacts on tribal cultural resources. If there may be tribal cultural resources at the location of a project site, tribal consultation in accordance with AB 52 would help ensure protection of tribal cultural resources. However, tribal territory often crosses the boundaries of multiple jurisdictions within and outside of the SJCOG region, and there could be several minor impacts to tribal cultural resources that together would result in a significant cumulative impact. But with the potential for cumulative impacts related to tribal cultural resources under the 2022 RTP/SCS are less than significant with mitigation, its contribution would not be cumulatively considerable. Mitigation Measures CR-2 (a, b), TCR-1(a), and TCR-1(b) would reduce these impacts to a less-than-cumulatively-considerable level.

This page intentionally left blank.

4.16 Wildfire

This section analyzes wildfire impacts from buildout of the 2022 RTP/SCS. Impacts related to emergency response plans, exposure to wildfire risk factors, associated infrastructure, and exposure to people or structures due to post-fire risks are addressed.

4.16.1 Setting

a. Physical Setting

Wildfires

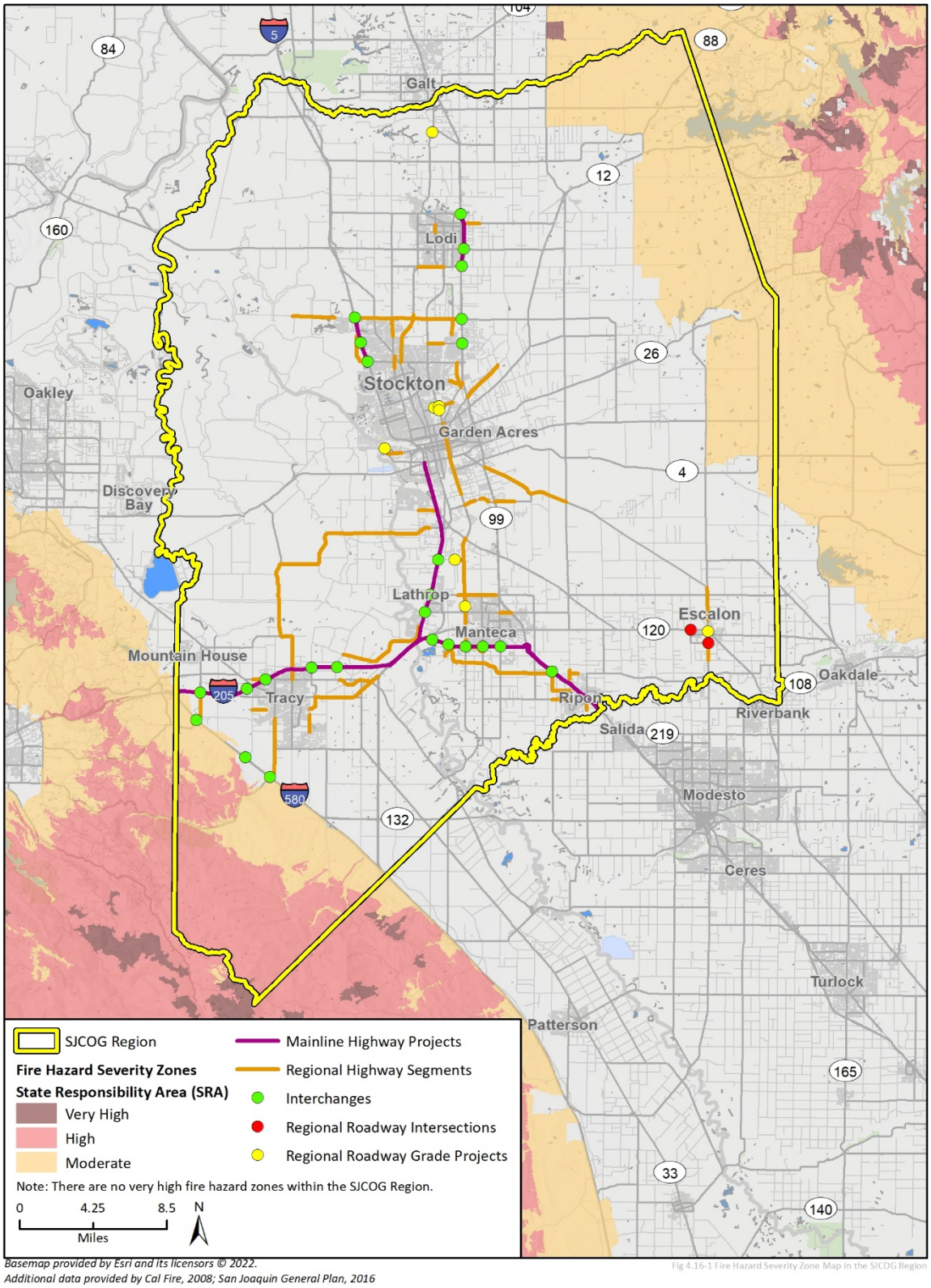
In California, responsibility for wildfire prevention and suppression is shared by federal, State, and local agencies. Federal agencies are responsible for federal lands in Federal Responsibility Areas. California has determined that some non-federal lands in unincorporated areas with watershed value are of statewide interest and have classified those lands as State Responsibility Areas (SRA), which are managed by the California Department of Forestry and Fire Protection (CAL FIRE). All incorporated areas and other unincorporated lands are classified as Local Responsibility Areas (LRA).

While all of California is subject to some degree of wildfire hazard, there are specific features that make certain areas more hazardous. CAL FIRE is required by law to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors (Public Resources Code [PRC] 4201-4204 and California Government Code 51175-89). Factors that increase an area's susceptibility to fire hazards include slope, vegetation type and condition and atmospheric conditions. CAL FIRE has identified two types of wildfire risk areas: 1) Wildland Areas That May Contain Substantial Forest Fire Risks and Hazards and 2) Very High Fire Hazard Severity Zones. Each risk area carries with it code requirements to reduce the potential risk of wildfires. Under state regulations, areas within very high fire hazard risk zones must comply with specific building and vegetation management requirements intended to reduce property damage and loss of life within these areas.

Throughout the SJCOG region, there is a full range of conditions and fire hazards as indicated in the applicable Fire Hazard Severity Zone Maps for the region. According to the San Joaquin County Fire Hazard Severity Zones in SRAs (CAL FIRE 2007), moderate hazard zones are present in the northeastern and southwestern portions of the county, and high hazard zones are mapped in the southwestern portion of the county (CAL FIRE 2007). CAL FIRE has determined that this county has no Very High Fire Hazard Severity Zones in LRAs (CAL FIRE 2008). Moderate Fire Hazard Severity Zones in LRAs exist throughout the SJCOG region (CAL FIRE 2008).

Development that has spread into less densely populated, often hilly areas, has increased the number of people living in heavily vegetated areas that are prone to wildfire and more difficult to battle due to the hilly terrain. The area where wildlands meet urban development is referred to as the wildland-urban interface, where urban wildfires occur. The 2020 Santa Clara Unit (SCU) Lightning Complex Fire started in multiple locations throughout Santa Clara County, Alameda County, Contra Costa County, San Joaquin County, Merced, and Stanislaus County and is ranked as the fourth largest wildfire in California history (CAL FIRE 2022). The SCU Lightning Complex Fire resulted in 396,624 burned acres and destroyed 222 structures (CAL FIRE 2022) and is an example of the major losses that can result from a fire in the wildlife-urban interface.

Figure 4.16-1 San Joaquin County Fire Hazard Severity Zone Map



4.16.2 Regulatory Setting

a. Federal Regulations

International Fire Code

The International Fire Code (IFC), created by the International Code Council, is the primary means for authorizing and enforcing procedures and mechanisms to ensure the safe handling and storage of any substance that may pose a threat to public health and safety. The IFC regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. The IFC and the International Building Code use a hazard classification system to determine what protective measures are required for fire and life safety. These measures may include construction standards, separations from property lines, and specialized equipment. To ensure that these safety measures are met, the IFC employs a permit system based on hazard classification. The IFC is updated every three years and is the basis for the California Fire Code (CFC) (also updated triennially). Local jurisdictions, including the SJCOG region cities, then adopt the CFC, in some cases with local amendments.

Federal Disaster Mitigation Act

The Disaster Mitigation Act of 2000 provided a new set of mitigation plan requirements that encourage state and local jurisdictions to coordinate disaster mitigation planning and implementation. States are encouraged to complete a "Standard" or an "Enhanced" Natural Mitigation Plan. "Enhanced" plans demonstrate increased coordination of mitigation activities at the state level and, if completed and approved, increase the amount of funding through the Hazard Mitigation Grant Program. The State of California Multi-Hazard Mitigation Plan (SHMP) complies with this act.

National Fire Plan

The U.S. Department of the Interior's National Fire Plan is intended to ensure an appropriate federal response to severe wildland fires, reduce fire impacts on rural communities, and ensure sufficient firefighting capacity in the future. The Rural Fire Assistance program is funded to enhance the fire protection capabilities of rural fire districts and safe and effective fire suppression in the wildland/urban interface. The program promotes close coordination among local, state, tribal, and federal firefighting resources by conducting training, equipment purchase, and prevention activities on a cost-shared basis.

b. State Regulations

2019 Strategic Plan for California

The 2019 Strategic Plan prepared by CAL FIRE and the California Natural Resources Agency lays out central goals for reducing and preventing the impacts of fire in the State. The goals are meant to establish, through local, State, federal, and private partnerships, a natural environment that is more resilient and human-made assets that are more resistant to the occurrence and effects of wildland fire.

In addition to the 2019 Strategic Plan for California, individual CAL FIRE units develop fire plans, which are major strategic documents that establish a set of tools for each CAL FIRE unit for its local

area. Updated annually, unit fire plans identify wildfire protection areas, initial attack success, assets and infrastructure at risk, pre-fire management strategies, and accountability within their unit's geographical boundaries. The unit fire plan identifies strategic areas for pre-fire planning and fuel treatment as defined by the people who live and work locally. The plans include contributions from local collaborators and stakeholders and are aligned with other plans for the area.

California Building Code (2019)

Chapter 7A of the California Building Code (California Code of Regulations, Title 24, Part 2) includes specific requirements related to exterior wildfire exposure. These requirements establish minimum standards to protect buildings located in Fire Hazard Severity Zone within SRAs and Wildland-Urban Interface Fire Areas. This code includes provisions for ignition resistant construction standards for new buildings.

California Fire Code

The 2019 California Fire Code (California Code of Regulations, Title 24, Part 9) establishes the minimum requirements consistent with nationally recognized good practices to safeguard the public health, safety, and general welfare for the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises, and to provide safety and assistance to firefighters and emergency responders during emergency operations. The provisions of this code apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, and demolition of buildings or structures or any appurtenances connected or attached to such building structures throughout California.

Wildland-Urban Interface Building Standards

On September 20, 2007, the Building Standards Commission approved the Office of the State Fire Marshal emergency regulations amending the California Code of Regulations, Title 24, Part 2, known as the California Building Code (CBC). These codes include provisions for ignition-resistant construction standards in the WUI.

California Emergency Services Act

The California Emergency Services Act of 2008 merged the duties, powers, purposes, and responsibilities of OES and the Governor's Office of Homeland Security into a new cabinet-level agency, the California Emergency Management Agency (Cal EMA). In 2013, the Governor merged the California Emergency Management Agency with the Office of Public Safety Communications and renamed the organization the California Governor's Office of Emergency Services (Cal OES). CAL OES is responsible for overseeing and coordinating emergency preparedness, response, recovery, and homeland security activities within the California. Section 8687.7 of the California Disaster Assistance Act required the development of a Standard Emergency Management System (SEMS) program, for managing multiagency and multijurisdictional responses to emergencies in California. The Cal OES Emergency Management Systems Unit is a multi-agency group charged with methodical review, evaluation, and approval of needed improvements to SEMS. State agencies are required to use SEMS and local government entities must use SEMS in order to be eligible for any reimbursement of response-related costs under the State's disaster assistance programs.

Cal OES serves as the lead State agency for emergency management and coordinates the State response to major emergencies in support of local government. SEMS provides the mechanism by

which local governments request assistance from Cal OES, and Cal OES maintains oversight of the State's mutual aid system.

State of California Emergency Plan

The Cal OES Emergency Plan outlines a state-level strategy to support local government efforts during a large-scale emergency. In accordance with the California Emergency Services Act, the State Emergency Plan describes methods for carrying out emergency operations, mutual aid processes, emergency services of governmental agencies, resource mobilization, emergency public information, and continuity of government (Cal OES 2017).

California Multi-Hazard Mitigation Plan

The California Office of Emergency Services prepares the State Hazard Mitigation Plan (SHMP), which identifies hazard risks and includes a vulnerability analysis and a hazard mitigation strategy (Cal OES 2018). The SHMP is required under the Disaster Mitigation Act of 2000 for the State to receive federal funding. The Disaster Mitigation Act of 2000 requires a State mitigation plan as a condition of disaster assistance.

The SHMP represents the state's primary hazard mitigation guidance document - providing an updated analysis of the state's historical and current hazards, hazard mitigation goals and objectives, and hazard mitigation strategies and actions. The plan represents the state's overall commitment to supporting a comprehensive mitigation strategy to reduce or eliminate potential risks and impacts of disasters in order to promote faster recovery after disasters and, overall, a more resilient state. State Hazard Mitigation Plans are required to meet the Elements outlined in FEMA's State Mitigation Plan Review Guide (revised March 2015, effective March 2016).

OES is responsible for the development and maintenance of the State's plan for hazard mitigation. The State's multi-hazard mitigation plan was last approved by the Federal Emergency Management Agency (FEMA) as an Enhanced State Mitigation Plan in 2018. The plan is designed to reduce the effects of disasters caused by natural, technological, accidental, and adversarial/human-caused hazards. The SHMP sets the mitigation priorities, strategies, and actions for the state. The plan also describes how risk assessment and mitigation strategy information is coordinated and linked from local mitigation plans into the SHMP and provides a resource for local planners of risk information that may affect their planning area. The State of California is required to review and revise its mitigation plan and resubmit for FEMA approval at least every five years to ensure continued funding eligibility for certain federal grant programs.

Senate Bill 1241 (Kehoe) of 2012

Senate Bill 1241 (Chapter 311, Statutes of 2012) requires cities and counties to address fire risk in SRAs and VHFHSZs in the safety element of their general plans. It also requires cities and counties to make certain findings regarding available fire protection and suppression services before approving a tentative subdivision map or parcel map.

Assembly Bill 3074 (Friedman) of 2020

Assembly Bill 3074 (Chapter 259, Statutes of 2020) imposes additional fuel reduction requirements on a person who owns, leases, controls, operates, maintains, or builds an occupied dwelling or structure in, upon, or adjoining wild lands within a very high fire hazard severity zone.

SRA Fire Safe Regulations

The State Responsibility Area (SRA) Fire Safe Regulations CCR Title 14, Division 1.5, Section 1270 et seq. establishes CAL FIRE's basic wildland fire protection standards for new development and is applicable in all SRAs in California—areas where CAL FIRE is responsible for wildfire protection.

c. Regional and Local Laws, Regulations, and Policies

Local Hazard Mitigation Plan

Due to the extensive history of natural disasters occurring throughout California, the State encourages communities to adopt Local Hazard Mitigation Plans (LHMPs) to gather hazard risk data and ensure local-level mitigation and preparedness. Local jurisdictions develop, adopt and update hazard mitigation plans to establish guiding principles for reducing hazard risk, as well as specific mitigation actions to eliminate or reduce identified vulnerabilities. The San Joaquin County Local Hazard Mitigation Plan (2017) serves to reduce or eliminate long-term risk to people and property from natural hazards and their effects in the SJCOG region, including the County of San Joaquin and the cities of Stockton, Lodi, Manteca, Tracy, Ripon, Escalon, and Lathrop. The plan includes goals and policies to reduce fire severity and intensity in the county through wildfire prevention, fuels management, and maintenance of evacuation routes. The Local Hazard Mitigation Plan is required to be updated every five years.

General Plans

Local planning policies related to wildfire hazards are established in each jurisdiction's general plan, generally in the Safety Element or equivalent chapter. For emergency services, some of the relevant policies include coordinating with other agencies responsible for planning medical facilities to meet the health care needs of residents in the region, retaining hospitals, evaluating medical facility proposals, providing emergency response services, and participating in mutual-aid agreements. Example county General Plan goals and policies are provided below.

County of San Joaquin General Plan

The San Joaquin County Public Health and Safety Element contains goals and policies with the specific intention of reducing the region's fire hazard risk. It was adopted in 2016 and demonstrates the County's compliance with fire prevention and protection requirements outlined in State law (San Joaquin 2016).

- **Policy IS-5.6 Consistent Fire Protection Standards for New Development** The County, in coordination with local water agencies and fire protection agencies, shall ensure consistent and adequate standards for fire flows and fire protection for new development. (RDR/IGC)
- **Goal PHS-4 To minimize the risk of wildland and urban fire hazards**
- **PHS-4.1 Community Wildfire Protection Plan** The County shall maintain and implement the Community Wildfire Protection Plan as a mechanism for community input and identification of areas with high fire hazard risk. (PSP)
- **PHS-4.2 Residential Densities in High Hazard Areas** The County shall restrict development to rural residential densities or lower and require on-site fire suppression measures in areas with high or extreme wildfire hazards. (RDR/PSP)
- **PHS-4.3 Fire Prevention Measures** The County shall implement State recommendations for fire prevention in Fire Hazard Severity Zones and require new and/or existing development to

provide clearance around structures, use fire-resistant ground cover, build with fire-resistant roofing materials, participate in fuel load reduction, and take other appropriate measures. (RDR/PSP)

- **PHS-4.4 Clear Zones** The County shall require clear zones and regular weed abatement around residential structures in high fire hazard areas and assist property owners in identifying how clear zones should be maintained. (RDR)
- **PHS-4.5 Vegetation and Fuel Management** The County shall require new development in high fire-hazard areas to have fire-resistant vegetation, cleared fire breaks separating communities or clusters of structures from native vegetation, or a long-term comprehensive vegetation and fuel management program consistent with State codes 4290 and 4291 for wildland fire interface and vegetation management. (RDR/PSP)
- **PHS-4.6 Fire Protection Coordination** The County shall encourage well-organized and efficient coordination among fire agencies, CalFire, and the County. (IGC)

City General Plans

The City of Lathrop General Plan Part VI, Hazard Management Plan, combines the Safety and Noise elements into a single element (City of Lathrop 1991). The Hazard Management Plan contains policies which primarily focus on mitigating structural fires, rather than wildland fires. Other cities in the SJCOG Region, such as Stockton and Escalon, have similar General Plan goals and policies that address municipal and structural fire, as the cities are not located in an area identified with past or projected wildfire hazards.

However, the City of Lathrop General Plan does have policies that address wildland fires and emphasize community response such as Goal Number 8 - Policies 1, 3 4, 5, 6, and 7 and water supply with Goal Number 8 - Policy 2. Goal No. 8 Public Safety Hazards establishes the following policies:

1. The reduction of loss of life or property due to crime, fire, earthquake, flooding or other disasters or hazards.
2. The provision of adequate medical and emergency services to reduce the effects of natural or manmade disasters.
3. The promotion of citizen awareness and preparedness for emergency/disaster situations or potential for the incidence of crime.
4. The implementation of adequate inter-agency disaster planning.

The City of Ripon's Community Health and Safety Element contains policies to protect people and property from fire risk (City of Ripon 2006). Goal D seeks to prevent loss of life, injury, and property damage due to wild land and urban fires. The policies to address Goal D include Policy D1, D2, D3, D4, D5, and D6. The policies are as follows:

> D1. All new non-residential development will be equipped with automatic interior sprinkler systems to meet the Uniform Building Code.
>
> D2. Encourage the Ripon Consolidated Fire District to maintain a regular program of fire inspection for existing commercial and industrial buildings. Involve the District at the planning stage of new development to ensure Volume I- Chapter Four Community Health and Safety 4-3 Adopted September 19, 2006, appropriate life safety and fire issues are addressed.

D3. Require that the construction of new roads and streets be adequate as to width and turning radius to simplify access by firefighting apparatus. Plans for new streets will be submitted for review and comment to the Ripon Consolidated Fire District.

D4. All development will be required to meet the minimum fire flow rates specified by the City's Fire Code.

D5. Enforce building and fire codes and City ordinances regarding fire protection.

D6. Support the Ripon Consolidated Fire District in the establishment and adjustments of fees and/or funds collected from new development for capital facilities, apparatus, and equipment required to mitigate the impact of new growth.

The City of Tracy General Plan Safety Element contains five policies specifically related to fire hazards that evaluate the potential for wildland fire hazards when considering new development (City of Tracy 2011). Polices P1-P5 in the City of Tracy General Plan require the following:

P1. All development in areas of potential wildland fire hazards shall include the following:

- Clearance around structures.
- Fire-resistant ground cover.
- Fire-resistant roofing materials.

P2. Development in areas with steep terrain shall be restricted as necessary in order to ensure fire safety.

P3. New developments shall satisfy fire flow and hydrant requirements, street widths and design requirements as established by the City.

P4. The City shall incorporate drought-resistant and fire-resistant plants in public works projects in areas subject to wildland fires.

P5. The City of Tracy Fire Department shall train regularly for urban and wildland firefighting conditions.

These policies are achieved through Action A1 which requires the maintenance of a current map of areas subject to wildland fires.

Other cities in the SJCOG Region, such as Manteca and Lodi, have similar provisions, goals, policies, and regulations in their General Plans and municipal ordinances.

City of Tracy Local Hazard Mitigation Plan

City of Tracy developed this Local Hazard Mitigation Plan (LHMP) update to make the city and its residents less vulnerable and more resilient to future hazard events, including wildfires. The LHMP identifies communities within their jurisdiction that are most at risk for wildfires. The LHMP also identifies guidance for future development within the City of Tracy to combat wildfire risk.

4.16.3 Impact Analysis

a. Methodology and Significance Thresholds

Pursuant to the CEQA Guidelines, potentially significant impacts would result if the project would:

1. If located in or near SRAs or lands classified as very high fire hazard severity zones, would the project:
   a. Substantially impair an adopted emergency response plan or emergency evacuation plan.
   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.
   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.
   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.

The methodology used for the following evaluation is based on a review of documents and publicly available information about wildfire conditions in the SJCOG region to determine the potential for implementation of projects in 2022 RTP/SCS to result in increased wildfire risks. This includes city and county planning documents. This program-level analysis is based on an overall understanding of the key fire safety concerns that could result from implementation of 2022 RTP/SCS. The evaluation of wildfire impacts reasonably assumes that the construction and development under 2022 RTP/SCS would adhere to the latest federal, state, and local regulations, and conform to the latest required standards in the industry, as appropriate for individual projects.

b. Project Impacts and Mitigation Measures

The following section discusses potential impacts and mitigation measures that may be associated with projects contained within the 2022 RTP/SCS. Section 4.15.3 summarizes the impacts associated with capital improvement projects proposed in the 2022 RTP/SCS. Due to the programmatic nature of the 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following section.

Threshold 1:	If located in or near state responsibility areas or lands classified as VHFHSZs: a) 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 b) 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 c) 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 d) expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires

Impact WF-1 PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE 2022 RTP/SCS WOULD BE LOCATED IN OR NEAR AN SRA OR VERY HIGH FIRE HAZARD SEVERITY ZONE, AND SIGNIFICANT RISKS OF LOSS, INJURY, OR DEATH FROM WILDFIRES OR DOWNSTREAM FLOODING OR LANDSLIDES WOULD OCCUR. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED.

Wildland Fire

As shown in Figure 4.16-1, moderate hazard zones are present in the northeastern and southwestern portions of the SJCOG region, and high hazard zones are mapped in the southwestern portion of the region. The land use scenario envisioned by the 2022 RTP/SCS concentrates the forecasted population and employment growth in urban areas and corridors of the County, such as incorporated cities, unincorporated towns, and major roadways, where the risk of wildfire is less than in more rural, forested, or mountainous areas where fuels are abundant and emergency response access is restricted. 2022 RTP/SCS transportation improvements, including roadway improvements, transportation demand management, and transit improvements, would not involve developing residential uses that would include occupants. While some transportation projects may include office or maintenance structures, occupation would be temporary and would not be situated in very high FHSZs or SRAs. Additionally, transportation projects associated with the 2022 RTP/SCS would improve mobility in the SJCOG region, which could facilitate an expedited evacuation or escape during a wildfire. These projects would increase the exposure of transportation infrastructure to risk of loss or damage from wildfire.

Fire-related impacts may extend far beyond the fire footprint as damage to homes, infrastructure, and ecosystems, and diminished air and water quality could all occur. People residing in residential development could be exposed to smoke and air pollution from wildfires regardless of their location within urbanized areas or the WUI. However, requirements to adhere to the local hazard mitigation plan, as well as the local general plan policies and programs aimed at reducing the risk of wildfires through land use compatibility, training, sustainable development, brush management, public outreach, and service standards for fire departments would reduce the risk of wildfire for these projects. Additionally, CBC regulations have been prepared and adopted for the purpose of establishing minimum wildfire protection standards in conjunction with building, construction, and development in a SRA. Title 14 sets forth the minimum development standards for emergency access, including fuel modification, setback, signage, and water supply, which are intended to result

in development that avoids or minimizes the hazards associated with development including associated infrastructure to roads, fuel breaks, emergency water sources, power lines or other utilities in wildfire-prone areas.

Potential impacts associated with the proposed circulation and emergency access routes for 2022 RTP/SCS are discussed in Section 4.14, *Transportation and Circulation*. As discussed therein, 2022 RTP/SCS projects would require adequate emergency access and the approval of project-specific on-site circulation plans that would comply with County design standards to accommodate emergency vehicles and service vehicles. Therefore, impacts associated with impairment of emergency response and evacuation plans would be less than significant.

Although there are limited instances where the proposed land use pattern and planned transportation investments of 2022 RTP/SCS may result in growth in or near wildfire prone areas, substantial wildfire-related effects could still occur. The 2022 RTP/SCS plans for the construction and maintenance of associated infrastructure and envisions land development near SRAs. Title 14 sets forth the minimum development standards for emergency access, fuel modification, setback, signage, and water supply, which are intended to result in development that avoids or minimizes the hazards associated with development including associated infrastructure to roads, fuel breaks, emergency water sources, power lines or other utilities in wildfire-prone areas. Global climate change will pose an increasing threat to wildland areas and nearby urban environments. The 2022 RTP/SCS plans for the construction and maintenance of associated infrastructure and envisions land development within and near these areas. The potential for slope failure and landslides can be exacerbated in these regions in the aftermath of a wildfire. Due to the unpredictable nature of wildfires in California, it is anticipated that projects in the 2022 RTP/SCS could exacerbate wildfire risk both in exposure to wildfires and in the aftermath conditions as a result of runoff, post-fire slope instability, or drainage changes as a result of wildfires denuding a slope. However, requirements to adhere to the local hazards mitigation plan, as well as the local general plan policies and programs aimed at reducing the risk of wildfires through land use compatibility, training, sustainable development, brush management, public outreach, and service standards for fire departments in addition to implementation of Mitigation Measures WF-1(a) and WF-1(b) reduce the risk of wildfire for these projects. With implementation of these measures and compliance with aforementioned plans and regulations, impacts would be reduced to less than significant.

Construction and Fire Risk

There are 2022 RTP/SCS projects that are adjacent to SRAs. However, even though there are no projects located within an SRA, construction activities for transportation and land use projects within the 2022 RTP/SCS involving the use of vehicles and heavy machinery could result in the ignition of a wildfire. During construction, heavy equipment and passenger vehicles driving on vegetated areas prior to clearing and grading could increase the risk of fire. Heated mufflers, explosives used during site preparation or line spicing, and improper disposal of cigarettes could potentially ignite surrounding vegetation. The use of heavy equipment, such as bulldozers and graders, has the potential to accidentally ignite a fire from sparks created when equipment blades strike rocks or metal objects. If noticed by the equipment operator or other project specific personnel, small ignitions can easily be suppressed by the construction equipment and/or on-site fire watch personnel. A fire could also be started by project personnel improperly disposing of burning cigarettes in areas covered with wildland vegetation and within 50 feet of combustible material storage.

Moreover, if the introduction of invasive, non-native plants is not controlled during construction, a project site could progressively become dominated by non-native plants which tend to increase the frequency and severity of wildfires. Based on recent scientific evidence, it is likely that anthropogenic climate change will continue to chronically enhance the potential for western U.S. forest fire activity when fuels are not limiting. As discussed further in Section 4.9, *Greenhouse Gas Emissions and Climate Change*, increasingly difficult drought conditions and extreme weather events will continue to raise wildfire risk within the SJCOG region.

New construction would be subject to the latest California Fire Code, which contains safety measures to minimize the threat from wildfires. Title 14 of the California Code of Regulations sets forth the minimum development standards for emergency access, fuel modification, setback, signage, and water supply, which help prevent loss of structures or life by reducing wildfire hazards. The codes and regulations would reduce the risk of loss, injury, or death from wildfire for new development envisioned by the 2022 RTP/SCS. With implementation of Mitigation Measures WF-1(a) and WF-1(b)and compliance with aforementioned plans and regulations, impacts would be reduced to less than significant.

Exacerbated Fire Risks

Slope failure and landslides can be exacerbated in regions in the aftermath of a wildfire. Hillsides can become denuded of vegetation and become unstable, increasing the potential for landslide risks and associated hazards downslope from such landslides. Potential impacts related to slope stability and landslides are discussed in Section 4.8, *Geology and Soils*. As discussed therein, stable slope conditions vary depending on location of the project within the region and the potential for substantial landslides was found to be low to moderate in most of the proposed project regions. Steep slopes within the SJCOG region are relatively limited and primarily found in the southwestern portion of San Joaquin County, along with smaller slopes susceptible to instability located throughout the Delta area's levee system (San Joaquin County 2014). In addition, in areas of high susceptibility to landslides (near foothill areas), 2022 RTP/SCS projects would be required to conform to San Joaquin County slope stability guidelines of Chapter 14 Grading Ordinance 4477, prior to approval of construction. With compliance to County regulations, this impact would be less than significant.

This same issue applies to runoff and flooding potential after a wildfire with denuded and unstable hillsides. Potential impacts related to flooding, runoff, and drainage are discussed in Section 4.11, *Hydrology and Water Quality*. Projects would be required to comply with existing design guidelines and local requirements for post-development peak stormwater flows and Best Management Practices to avoid and/or minimize flooding impacts and impacts to on-site and off-site drainage. Even through adherence to these regulations, impacts associated with exposure of people or structures to downslope or downstream flooding or landslides as a result of runoff due to post-fire slope instability would continue to be significant. The project would be required to comply with existing design guidelines, applicable San Joaquin County Flood Control & Water Conservation District (Flood Control) requirements for post-development peak stormwater flows and Best Management Practices, and maintenance requirements described in the Neighborhood Stormwater Control Plans to avoid and/or minimize flooding impacts and impacts to on-site and off-site drainage. Compliance with Flood Control rules and regulations and local General Plan policies in addition to implementation of Mitigation Measures WF-1(a) and WF-1(b) would minimize the potential for adverse wildfire impacts to result from buildout of the 2022 RTP/SCS. Furthermore, reasonably foreseeable development facilitated by the 2022 RTP/SCS would be required to

implement additional mitigation if project-specific analysis identifies the potential for wildfire impacts. Therefore, impacts would be less than significant with mitigation incorporated.

Mitigation Measures

Transportation project sponsor agencies can and should implement, the following mitigation measures for applicable transportation projects that would result in wildfire impacts. The County and cities in the SJCOG region can and should implement these measures, where relevant to land use projects implementing the 2022 RTP/SCS. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions.

WF-1(a) Wildfire Risk Reduction

If an individual transportation or land use project included in 2022 RTP/SCS is located within or less than two miles from an SRA or very high fire hazard severity zones, the implementing agency shall require appropriate mitigation to reduce the risk. Examples of mitigation to reduce risk of loss, injury or death from wildlife include, but are not limited to:

- Require the use of fire-resistant vegetation native to San Joaquin County and/or the local microclimate of the project site and discourage the use of fire-prone species especially nonnative, invasive species.
- Enforce defensible space regulations to keep overgrown and unmanaged vegetation, accumulations of trash and other flammable material away from structures.
- Provide public education about wildfire risk, fire prevention measures, and safety procedures and practices to allow for safe evacuation and/or options to shelter-in-place.
- Require adherence to the local hazard mitigation plan, as well as the local general plan policies and programs aimed at reducing the risk of wildfires through land use compatibility, training, sustainable development, brush management, public outreach, and service standards for fire departments.
- Ensure sufficient emergency water supply.
- Encourage the use of fire-resistant vegetation native to San Joaquin County and/or the local microclimate of the project site and discourage the use of fire-prone species especially non-native, invasive species.
- Require a fire safety plan be submitted to and approved by the local fire protection agency. The fire safety plan shall include all of the fire safety features incorporated into the project and the schedule for implementation of the features. The local fire protection agency may require changes to the plan or may reject the plan if it does not adequately address fire hazards associated with the project as a whole or the individual phase of the project.
- Prohibit certain project construction activities with potential to ignite wildfires during red-flag warnings issued by the National Weather Service for the project site location. Example activities that should be prohibited during red-flag warnings include welding and grinding outside of enclosed buildings.
- Require fire extinguishers to be onsite during construction of projects. Fire extinguishers shall be maintained to function according to manufacturer specifications. Construction personnel shall receive training on the proper methods of using a fire extinguisher.
- Smoking and open fires shall be prohibited at individual transportation or land use projects sites included in 2022 RTP/SCS during construction and operations. A copy of the notification to all contractors regarding prohibiting smoking and burning shall be provided to the County.

WF-1(b) Fire Protection Plan

Individual transportation or land use projects included in the 2022 RTP/SCS shall prepare a Fire Protection Plan that meets Fire Prevention Bureau of San Joaquin County requirements. The plan shall contain (but not be limited to) the following provisions:

- All construction equipment shall be equipped with appropriate spark arrestors and carry fire extinguishers.
- A fire watch with appropriate firefighting equipment shall be available at the Project site at all times when welding activities are taking place. Welding shall not occur when sustained winds exceed that set forth by the Fire Prevention Bureau of San Joaquin County unless a Fire Prevention Bureau of San Joaquin County -approved wind shield is on site.
- A vegetation management plan shall be prepared to address vegetation clearance around all Wind Turbine Generators (WTGs) and a regularly scheduled brush clearance of vegetation on and adjacent to all access roads, power lines, and other facilities.
- Operational fire water tanks shall be installed prior to construction.
- Provisions for fire/emergency services access if roadway blockage occurs due to large loads during construction and operation
- Cleared, maintained parking areas shall be designated; no parking shall be allowed in non-designated areas.
- The need for and/or use of dedicated repeaters for emergency services.
- Appropriate Hot work permits (such as cutting and welding permits) shall be obtained from the jurisdictional fire agency.
- Compliance with California PRC 4291, 4442, and 4443.

IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate.

Significance After Mitigation

With implementation of Mitigation Measures WF-1(a) and WF-1(b), the risk of loss of structures and transportation infrastructure and the risk of injury or death due to wildfires would be reduced. These measures would make structures and transportation infrastructure more fire resistant and less vulnerable to loss in the event of a wildfire. These measures would also reduce the potential for construction of 2022 RTP/SCS projects to inadvertently ignite a wildfire. In addition, specific project impacts regarding wildfire risk would be addressed prior to project implementation during the planning and design process.

Compliance with local, State, and federal rules and regulations and local General Plan policies in addition to implementation of Mitigation Measures WF-1(a) and WF-1(b) would minimize the potential for adverse wildfire impacts to result from buildout of the proposed 2022 RTP/SCS. Furthermore, reasonably foreseeable development facilitated by the 2022 RTP/SCS would be required to implement additional mitigation if project-specific analysis identifies the potential for wildfire impacts. Therefore, impacts would be less than significant with mitigation incorporated.

c. Specific 2022 RTP/SCS Projects That May Result in Impacts

As discussed above, specific 2022 RTP/SCS projects that could result in significant wildfire impacts are those located within or less than two miles from an SRA or high fire hazard severity zones. These projects would increase the potential to ignite fires and therefore risk exacerbating the potential for loss or damage from wildfire. The public who would use that infrastructure and land uses developed within those areas and the maintenance personnel who would service that infrastructure or work within those areas would also be exposed to exacerbated risk of loss or damage due to wildfire. 2022 RTP/SCS projects that do not meet these criteria would have a lesser wildfire impact.

Table 4.16-1 shows all 2022 RTP/SCS projects that would occur within or less than two miles from an SRA. All transportation or land use projects located within or less than two miles from near SRAs or lands classified as very high fire hazard severity zones would result in potentially exacerbated risks associated with Impact WF-1. Additional specific analysis described in the above mitigation measure would need to be conducted as individual projects are implemented in order to determine the magnitude of project-specific impacts.

Table 4.16-1 2022 RTP/SCS Planned and Programmed Projects Occurring In or Less Than 2 Miles from an SRA or Very High Fire Severity Zone

Project Title	Project Type	Description	Potential Impact
CALTRANS			
CT-2: I-205 Managed Lanes	HWY	Widen I-205 from 6 to 8 lanes from Alameda County line to Eleventh Street	WF-1
City of Tracy			
T-2: I-580 at International Parkway/Patterson Pass Road	HWY	Reconstruct interchange	WF-1
T-3: I-205 at Mountain House/International Parkway	HWY	Reconstruct interchange	WF-1
T-4: I-205 Grant Line Road	HWY	Modification of existing interchange	WF-1
T-5: I-205 at Chrisman Road	HWY	Phase I; Construct new interchange east-west ramps	WF-1
T-6: I-205/MacArthur Interchange Modification	HWY	Modification of existing interchange – environmental only	WF-1
T-7: I-580 at Corral Hollow Road	HWY	Modification of existing interchange – environmental only	WF-1
T-8: I-580 at Lammers Road	HWY	Construction of new interchange – environmental only	WF-1
T-9: I-580 at Iron Horse	HWY	Construction of new interchange – environmental only	WF-1
T-10: International Parkway	ST/RDS	Widen from 2 to 4 lanes, including reconstruction of Delta-Mendota Canal and California Aqueduct bridges from I-205 to I-580	WF-1
T-11: Corral Hollow Road	ST/RDS	Widen from 2 to 4 lanes from Parkside Drive to Linne Road	WF-1
T-14: Corral Hollow Road Widening	ST/RDS	Widen 2 to 4 lanes including ROW and construction of two bridges from Linne Road to I-580	WF-1

Project Title	Project Type	Description	Potential Impact
T-15: MacArthur Drive	ST/RDS	Extend 4 lane roadway on new alignment and construct railroad grade separation from Mt. Diablo Road to Eleventh Street	WF-1
T-16: Tracy Boulevard	ST/RDS	Widen from 4 lane minor arterial to 4 lane major arterial from I-205 to Eleventh Street	WF-1
T-17: TRACER Capital	Transit	Purchase replacement buses	WF-1
T-21: TRACER Capital	Transit	Construction of bus stop improvements every five years	WF-1
T-22: Tracy Municipal Airport	Airport	Install Helicopter Pad	WF-1
T-23: Tracy Municipal Airport	Airport	Aircraft Wash Facility	WF-1
T-24: Tracy Municipal Airport	Airport	Perimeter Fencing (1,100LF)	WF-1
T-25: Tracy Municipal Airport	Airport	Build Permanent Public Restrooms	WF-1
T-26: Tracy Municipal Airport	Airport	FBO Office - Repair FBO Building	WF-1
T-27: Tracy Municipal Airport	Airport	Land Acquisition Identified in Airport Master Plan	WF-1
San Joaquin County			
SJC-2: Grant Line Road Corridor Improvements	ST/RDS	Realign roadway and widen from 2 to 4 lanes with operational and safety improvements from Tracy City Limits to 11th Street	WF-1
SJC-3: Tracy Boulevard	ST/RDS	Passing lanes and channelization from I-205 to Howard Road	WF-1
SJC-4: Eleventh Street	ST/RDS	Operational and safety improvements along corridor and at intersections from Tracy City limits to I-5	WF-1
SJC-5: Roth Road	ST/RDS	Widen from 2 to 4 lanes with shoulders from UPRR to Airport Way	WF-1
SJRRC			
SJ07-6009	Rail	Realignment of tracking near Altamont Pass	WF-1
SJ07-6013	Rail	Restoration of abandoned Western Pacific Depot building	WF-1
SJ07-6016	Rail	Enhance/extend rail to benefit residents; integrate ACE with the State intercity rail service; extend ACE service	WF-1
SJ07-6017	Transit	Acquisition of ACE Corridor between Stockton and Niles Junction	WF-1
SJ07-6018	Rail	Commuter rail service	WF-1
SJ07-6017	Rail	Maintenance Facility Expansion from 9 train sets to 17 train sets Phase 2	WF-1
SJ07-9003	TCM	Signal system improvements, operational and intersection improvements to smooth traffic flow, closed circuit TV, freeway service patrols	WF-1
SJ14-6001	Rail	Extension of Wyche Siding	WF-1
SJ14-6002	Rail	Connection from UPRR Fresno Sub to UPRR Oakland Sub	WF-1

Project Title	Project Type	Description	Potential Impact
SJ14-6003	Rail	Grade crossing improvements/grade separations	WF-1
SJ14-6005	Rail Station	Facilities and information technology maintenance and enhancements, fleet vehicle replacements and expansion	WF-1
SJ14-6006	Rail Station	Construct park and ride lot and related on-street parking, sidewalks, lighting, security, and other passenger amenity improvements	WF-1
SJ14-5033	TCM	Construct solar power facilities for RTD Solar Power Project	WF-1
SJ18-6011	Rail Improvements	Improve the Union Pacific Railroad right-of-way from the San Joaquin County Line for a passenger rail service. Construction of a station and platform to accommodate the new passenger rail service with parking and access onto Patterson Pass Road. Construction of an operations and maintenance facility at Hanson Road in Tracy along the alignment.	WF-1

Notes:
Bike/Ped - Bicycle or Pedestrian
HWY – Highway
ST/RDS = Street or Roadway
TCM = Transportation control measure
Transit = Public Transportation Infrastructure
Various = Project/funding of different types

4.16.4 Cumulative Impacts

The cumulative impact analysis area for wildfires consists of the SJCOG region and adjoining counties. Information regarding these adjoining counties can be found in Section 3.1 – Environmental Setting, Table 3-1. The analysis in this section examines wildfire impacts of 2022 RTP/SCS transportation projects and land use scenario throughout the SJCOG region that are cumulative in nature. Land use development within the SJCOG region combined with the growth in the adjoining counties could potentially contribute to a cumulatively considerable increase in wildfire risk as portions of the SJCOG region and adjoining counties are in SRA high fire hazard severity zones.

The 2022 RTP/SCS is not expected to substantially increase wildfires, but the occurrence of wildfires always exists within the SJCOG region and transportation and land use projects under 2022 RTP/SCS could place people and structures within or less than two miles from an near SRAs or lands classified as very high fire hazard severity zones. Construction and operation of projects would risk exacerbating these existing fire hazards by creating additional potential sources of fire ignition.

During construction and operation of 2022 RTP/SCS projects, if one of these cumulative projects were to simultaneously result in a wildland fire ignition during construction, they could combine and increase the frequency of wildland fires beyond existing conditions. The combination of these projects being constructed concurrently could substantially increase the frequency of fire in the area above natural conditions. Cumulative impacts would be significant.

The land use scenario envisioned by the 2022 RTP/SCS that would be located within or less than two miles from an near SRAs or lands classified as very high fire hazard severity zones, would have potentially significant wildfire impacts, as existing codes and regulations cannot fully prevent wildfires from being generated and damaging structures or populations. These projects would increase the potential to ignite fires and therefore risk exacerbating the potential for loss or damage from wildfire. This added risk could start wildfires that could spread outside the SJCOG region impacting adjacent counties and communities. As a result, the 2022 RTP/SCS could result in a cumulatively considerable increase in wildfire risk. Mitigation measures described earlier in this section would minimize the contribution to this cumulative impact to a less-than-cumulatively-considerable level.

4.17 Effects Considered Less Than Significant

Section 15128 of the California Environmental Quality Act (CEQA) Guidelines requires an EIR briefly describe any possible effects that were determined not to be significant. The environmental factors discussed below are in response to the checklist questions listed in Appendix G of the CEQA Guidelines that were not discussed in the impact sections of the DEIR.

4.17.1 Mineral Resources

1) *Would the project 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?*

2) *Would the project 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?*

The 2022 RTP/SCS primarily involves modifications to existing roadways, including improvements related to highway, local street, active transportation, and transit investments. In addition, future infill and TOD would be located within existing urbanized areas. The San Joaquin County General Plan DEIR concluded that there are significant amounts of sand and gravel in the region, which are designated by California Geologic Survey (CGS) as Mineral Resource Zones (MRZ). Projects included in the 2022 RTP/SCS have the potential to be located on sites with known mineral resources or locally important mineral resources. All projects in the 2022 RTP/SCS would be required to adhere to the relevant policies and programs listed in the San Joaquin County General Plan that pertain to mineral resources. Policy NCR-4.1: Mineral Resource Protection states that the County shall require mineral deposits of significant quantity, value, or quality, as identified and updated by the State Division of Mines and Geology reports as MRZ-2 Mineral Resource Zones, to remain in agricultural or open space uses until the extraction of the resources, unless the immediate area has been committed to other uses. The 2022 RTP/SCS would not change land use designations and would adhere to the requirements of Policy NCR-4.1. The San Joaquin 2035 General Plan EIR also adds Mitigation Measure 4.O-1, NCR-NEW1, that states the County shall discourage the development of incompatible land uses, as defined by the State Mining and Geology Board (SMGB), within or immediately adjacent to existing and potential mineral resources sites, including existing and new MRZ-2 (Mineral Resources Zone 2) identified by Surface Mining and reclamation Act (SMARA) and locally important mineral resource sites as they are identified in the future such that development would impede or preclude mineral extraction or processing. Any projects located within a MRZ would be identified during the planning review for project-specific impacts pertaining to mineral resources. In addition, the project would be required to adhere to Policy NCR-4.2, Discretionary Permit to Protect Mineral Resources. This policy states that the County shall require all new development in areas of significant sand and gravel deposits, as identified by the State Division of Mines and Geology, to obtain a discretionary permit, conditioned to protect the resources. If any projects in the 2022 RTP/SCS are located in areas of significant and gravel deposits, they would be required to obtain a discretionary permit that adheres to the outlines of Policy NCR-4.2.

There are no projects included in the 2022 RTP/SCS that would directly result in the extraction, exploration, or digging for mineral resources, or prevent such activities. Therefore, the proposed 2022 RTP/SCS would not result in the loss of a known mineral resource that would be of value to the region and the residents of the State or result in the loss of availability of a locally important mineral resource recovery site. Impacts pertaining to mineral resources would be less than significant.

4.17.2 Noise

3) For a project located within the vicinity of a private airstrip or 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?

Any future land development project facilitated by implementation of the 2022 RTP/SCS located within an airport land use plan zone and/or applicable noise contour would be subject to the policies of the Airport Land Use Commission pertaining to noise exposure. This would ensure that noise attenuation features are implemented into each project if required. Therefore, this impact would be less than significant.

4.17.3 Population and Housing

1) Would the project induce substantial unplanned 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)?

2) Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Improvements associated with the 2022 RTP/SCS would not result in direct population growth beyond anticipated growth in the region. Rather, projects under the proposed 2022 RTP/SCS are designed to fully support the transportation needs of the growing population while implementing the infill development approach outlined in the 2022 RTP/SCS. The SCS is designed to accommodate growth by encouraging infill development in already urbanized areas. The transportation improvement projects under the 2022 RTP/SCS are intended and designed to support the land use patterns established in the SCS. Government Code Section 65080(b)(2)(B)(ii) requires that an RTP/SCS must accommodate all the population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan. In compliance with the requirements, the proposed 2022 RTP/SCS includes strategies to accommodate new housing units through 2046. The housing strategies would continue the SJCOG region's commitment to growth in infill areas but are also intended to protect current residents from displacement, preserve existing affordable housing, and produce new housing to secure long-term affordability for lower income populations. Therefore, the 2022 RTP/SCS is consistent with projected and planned growth. Further, all transportation improvement projects and land uses envisioned by the 2022 RTP/SCS are anticipated by the San Joaquin County 2035 General Plan, as all improvements have been coordinated with the local jurisdiction. Therefore, population and housing growth impacts would be less than significant.

4.17.4 Public Services

1) 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: fire protection; police protection; schools; parks; other public facilities?

Transportation projects under 2018 RTP/SCS would not generate demand for police or fire services, schools, parks, or other public facilities. The majority of projects are maintenance and rehabilitation,

or pedestrian improvement projects that do not involve the construction of new infrastructure. Future infill and TOD projects may increase demand on public services such as fire and police protection, schools, parks, or other public facilities.

Future growth and development may increase demand for public services; however, demand is not expected to exceed that already anticipated within the general plans and regional growth forecasts prepared for each respective area in which proposed SCS development would be located. Growth in the SJCOG region would not be a result of the proposed 2022 RTP/SCS. The proposed 2022 RTP/SCS is designed to accommodate the people, households, and jobs identified in regional growth forecasts. While growth would occur, the proposed 2022 RTP/SCS distributes this growth consistent with adopted plans and would not induce population growth beyond what has been previously anticipated. Additionally, the proposed 2022 RTP/SCS includes land use strategies that would allow for denser, more compact development in identified infill development areas, and therefore service areas for existing providers are not anticipated to expand. The San Joaquin General Plan includes policies and implementation programs to ensure adequate public services are maintained in the Public Facilities and Services Element. Policy 1.5 states that the County shall base the expansion of public facilities and services on current needs and planned or projected development patterns. (San Joaquin General Plan Update, 2016). Policy 2.6 of the Land Use Element states that the County shall encourage infill development to maximize existing infrastructure with the capacity to serve new development (San Joaquin General Plan Update, 2016). Cities have similar general plan policies. The SJCOG region has planned for growth that would be accommodated by the proposed 2022 RTP/SCS, and thus the 2022 RTP/SCS would be consistent with Policy 1.5 and 2.6. Planning for growth will continue to occur throughout implementation of the proposed 2022 RTP/SCS, and individual jurisdictions would increase services as necessary.

The number, location, physical sizes, and designs of future new and expanded fire and police protection facilities are unknown. As a result, specific environmental impacts associated with specific development cannot be speculated. However, if an individual jurisdiction chooses to increase fire or police protection facilities, the expansion of existing or development of new facilities would be subject to project-specific environmental review under CEQA whereby environmental impacts would be identified and mitigated accordingly. As mentioned above, growth that would be distributed by the proposed 2022 RTP/SCS has been accounted for within general plans and other regional growth forecasts. As such, any increased demand for fire or police protection facilities has been anticipated, and the proposed 2022 RTP/SCS would not induce growth such that increased fire or police protection facilities are necessary beyond what has already been determined by individual jurisdictions.

Future project sponsors are required by law to pay development impacts fees for schools at the time building permits are issued. The fees are used by a school district to mitigate impacts associated with long-term operation and maintenance of school facilities. Pursuant to Section 65996 of the California Government Code, payment of these fees fulfils complete mitigation of environmental impacts.

Through regulatory compliance, adequate parkland acreages would be maintained throughout the SJCOG region. For a full discussion of parks, refer to Section 14.18.5, *Recreation*, below.

Based on the above discussion, impacts related to public services would be less than significant

4.17.5 Recreation

1) *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?*

2) *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?*

The proposed 2022 RTP/SCS would accommodate the people, households, and jobs identified within the SJCOG's regional growth forecast. Transportation projects identified within the 2022 RTP/SCS would not generate demand for parks or recreation resources. However, the overall growth resulting from the land use pattern established by the proposed 2022 RTP/SCS would result in an increased demand for services including recreational facilities.

Development of the individual land use projects in the proposed 2022 RTP/SCS would be required on a project-by-project basis to pay development fees towards the applicable jurisdiction. Since the passage of the 1975 Quimby Act, cities and counties have been authorized to adopt ordinances requiring that developers set aside land, donate conservation easements, or pay fees that can be used for purposes of acquiring parkland to maintain identified parkland acreages per 1,000 in population. In accordance with the Quimby Act, the County of Stanislaus requires three net acres of developed neighborhood parks per 1,000 residents through land dedication and development (San Joaquin General Plan, 2016). Cities throughout the SJCOG region have similar requirements implemented into their General Plans. All future development under the proposed 2022 RTP/SCS would be required to comply with these regulations. The payment of fees or provision of parkland would go toward maintaining parks or providing new park space, which would also reduce use of existing recreational facilities. Reduced use of existing facilities would result in a corresponding decrease in deterioration of existing recreational facilities. Therefore, impacts related to recreation would be less than significant.

4.17.6 Utilities and Service Systems

1) *Would the project 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?*

2) *Would the project have sufficient water supplies available to serve the project and reasonably foreseeable development during normal, dry and multiple dry years?*

3) *Would the project result in a determination by the waste water treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's demand in addition to the provider's existing commitments?*

4) *Would the project 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?*

5) *Would the project comply with federal, state, and local management and reduction statutes related to solid waste?*

Would the project 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?

Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Future infill and development projects envisioned by the proposed 2022 RTP/SCS would occur in urbanized areas and would connect to existing utilities. However, the proposed 2022 RTP/SCS does not induce a population beyond what is generally projected and accounted for in local and regional plans. The proposed 2022 RTP/SCS is not inducing population growth, but rather establishing a framework to accommodate anticipated growth. As such, any growth facilitated by the proposed 2022 RTP/SCS would not require new utilities facilities beyond what is already anticipated in regional growth forecasts, Capital Improvement Programs (CIP), and general plans.

Urban Water Management Plans (UWMPs) for the SJCOG region estimate and pursue the efficient use of available water supplies identifying short-term and long-term water demand management measures. UWMPs are generally updated every five years to account for water demand resulting from the growth envisioned in general plan updates and updated population growth forecasts. Therefore, the current UWMPs applicable to the SJCOG region generally account for the land development envisioned within the proposed 2022 RTP/SCS because it is largely consistent with relevant planning documents, such as general plans. Furthermore, Groundwater Sustainability Plans (GSPs) prepared under the Groundwater Sustainability Act are implemented in order to protect groundwater in the SJCOG area. The proposed 2022 RTP/SCS would adhere to the water conservation requirements set forth within these plans. Regional growth forecasted within the proposed 2022 RTP/SCS, general plans, and other documents are accounted for in UWMPs and GSPs, and any growth facilitated by the proposed 2022 RTP/SCS would not be in excess of anticipated growth forecasts. Thus, proposed 2022 RTP/SCS would not result in insufficient water supplies or a determination by a wastewater treatment provider that inadequate capacity exists to serve the anticipated demand.

Transportation and land use development projects implementing the proposed 2022 RTP/SCS would be required to comply with the California Green Building Code and Senate Bill 1016, which require that construction operations recycle a minimum of 50 percent of waste generated. Similarly, land use projects would also be required to comply with federal, State, and local statutes and regulations related to solid waste, including a 50 percent diversion rate pursuant to Assembly Bill 939 and a future 75 percent diversion rate pursuant to Assembly Bill 341, as well as local jurisdiction goals and policies for recycling and diversion of solid waste. Compliance with these requirements would ensure that solid waste generated from land use development would be minimized to the extent practical, and that diversion rates would increase into the future, as development included in the 2022 RTP/SCS is built out. Non-diverted waste generated by transportation and land use development projects included in the proposed 2022 RTP/SCS would be disposed in the Foothill Sanitary Landfill, and multiple transfer stations within the SJCOG region (San Joaquin County, 2022). These landfill are adequate for handling existing solid waste and future waste generated through 2082 (San Joaquin County, 2022). Therefore, the proposed 2022 RTP/SCS would not generate solid waste in excess of State or local standards or conflict with federal, State, and local management and reduction statutes. Therefore, impacts related to utilities would be less than significant.

This page intentionally left blank.

5 Other CEQA Required Discussions

This section discusses growth-inducing impacts, irreversible environmental impacts, and significant and unavoidable impacts that would be caused from implementation of the proposed 2022 RTP/SCS.

5.1 Growth-Inducing Impacts

Section 15126.2(e) of the *State CEQA Guidelines* requires a discussion of a project's potential to induce growth. Specifically, an EIR must discuss the ways in which the proposed project could foster economic or population growth. Included in this category are projects that would remove obstacles to population growth. In addition, the EIR must discuss how the project may encourage and/or facilitate other activities that could significantly affect the environment. It cannot be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment. Economic and population growth does not necessarily create significant and direct physical changes to the environment. However, depending upon the type, magnitude, and location of growth, it can result in significant environmental effects. A project's growth inducing potential is considered significant if growth generated by the project could result in significant effects to one or more environmental issue areas.

5.1.1 Employment, Household, and Population Growth

University of the Pacific Center for Business and Policy Research completed a regional growth forecast for SJCOG in September 2020. The purpose of the regional growth forecast is to provide a consistent economic and population growth forecast to the year 2050 for use in long-range comprehensive planning. The forecast served as an input towards the development of the proposed 2022 RTP/SCS. SJCOG does not hold land use authority and cannot directly affect population growth, as development would be facilitated through implementation of the RTP/SCS, rather than proposing individual growth inducing projects. SJCOG growth forecasts are projections used to plan for public infrastructure, housing, and employment throughout the region. The proposed 2022 RTP/SCS net increase in households and employment opportunities, according to the 2020 regional forecast, is shown in Table 5-1.

Table 5-1 Net Increase in Households and Employment by Jurisdiction

	2020		2030		2040		2045	
Jurisdiction	**HH's**	**Emp.**	**HH's**	**Emp**	**HH's**	**Emp**	**HH's**	**Emp**
Escalon	2,664	2,335	2,912	2,616	3,006	2,731	3,046	2,829
Lathrop	6,937	8,881	11,561	11,350	16,098	12,479	18,459	13,388
Lodi	23,543	32,211	26,085	34,979	27,313	36,409	27,881	37,399
Manteca	26,055	21,103	30,899	24,266	34,871	26,273	37,027	27,604
Ripon	5,450	5,224	6,311	5,804	6,909	6,060	7,212	6,257
Stockton	96,474	157,422	105,132	179,253	108,140	187,520	109,358	193,373
Tracy	25,069	31,698	34,722	41,254	36,686	43,533	38,658	45,648
Unincorporated	43,333	71,662	47,752	78,969	47,780	80,862	47,596	82,963
County Total	**239,143**	**330,919**	**271,810**	**379,840**	**292,147**	**397,902**	**302,229**	**411,747**
Increase*	**-**	**-**	**13.7%**	**14.8%**	**22.2%**	**20.2%**	**26.4%**	**24.4%**

Source: SJCOG 2019 Regional Growth Forecast

HH = Households; Emp. = Employment

*Increase refers to the percent increase from 2020

The land use scenario envisioned by the proposed 2022 RTP/SCS would facilitate the development of infill and TOD projects within existing urbanized areas and therefore redistribute growth patterns. As discussed in Section 4.12, *Land Use and Planning*, and Section 4.17, *Effects Considered Less than Significant,* the proposed 2022 RTP/SCS identifies areas within the region sufficient to house all the forecast population of the region to the plan horizon year as well as identified housing needs under RHNA.

As discussed in Section 4.12, *Land Use and Planning*, the land use scenario envisioned in the proposed 2022 RTP/SCS was developed in close coordination with SJCOG member agency planning staff and also builds on local general plans and general plan updates currently in process or completed. Central to the SCS is a land use plan identifying the general location of uses, residential densities, and building intensities within the region. Starting with land uses allowed by existing adopted local General Plans, the land use plan envisioned by the proposed 2022 RTP/SCS provides for intensification of residential and commercial land uses in urban areas proximate to existing transit, aligning with existing and future transit priority areas (TPAs). The proposed 2022 RTP/SCS accounts for existing county land uses including the significant proportion of its land area that is in agricultural uses. the proposed 2022 RTP/SCS accounts for the land uses of the seven incorporated cities and 15 County rural community plans. The proposed 2022 RTP/SCS is consistent with local agencies' adopted General Plans and relies principally on available land use capacity in these plans. The proposed 2022 RTP/SCS would not require or promote any unplanned growth to meet its goals and is consistent with the RHNA allocation and projected housing needs.

Implementation of the proposed 2022 RTP/SCS would create short-term economic growth in the region as a result of construction-related job opportunities for the construction of transportation and land use projects. Implementation of the proposed 2022 RTP/SCS would also generate additional employment opportunities for roadway, vehicle, and landscape maintenance and transportation facility clean-up. The employment increase may subsequently increase the demand for support services and utilities, which could generate secondary employment opportunities. This additional economic growth would likely raise the existing revenue base within the region. Although

such growth may incrementally increase economic activity in the county, significant physical effects are not likely to result from economic growth generated by the proposed 2022 RTP/SCS.

Furthermore, while development envisioned as part of the proposed 2022 RTP/SCS could result in additional commerce, industry, recreation, public services, and infrastructure throughout the region, this economic activity would be consistent with the regional growth forecast and local general plans. Forecasted growth would be accommodated under the proposed 2022 RTP/SCS; therefore, the Plan would not be growth inducing, but rather it reflects the regulatory mandate to house the forecasted population and be based on the latest planning assumptions.

The proposed 2022 RTP/SCS was developed to integrate forecasted population increases, employment opportunities, and housing needs within the SJCOG area. Therefore, the proposed 2022 RTP/SCS is designed to accommodate growth that would occur with or without its adoption; it is not designed, nor is it anticipated to, induce population growth beyond the levels forecasted.

5.1.2 Removal of Obstacles to Growth

The proposed 2022 RTP/SCS transportation improvement projects are primarily located in existing urbanized areas and transit corridors in the cities of Stockton, San Joaquin, Manteca, Lodi, and Tracy; however, projects are also located in rural or semi-rural areas (ex. bridge replacement/retrofitting or roadside facilities). Such transportation improvements can be perceived as removing an obstacle to growth by either creating additional traffic capacity (in the case of a roadway widening) or providing new or easily facilitated access to undeveloped areas (in the case of a road extension). New infrastructure may also serve to accelerate, or shift planned growth or encourage and intensify unplanned growth. These transportation network improvements would remove obstacles to growth in some areas of the region, which would support additional housing, population and economic growth, and could therefore be considered growth inducing.

The proposed 2022 RTP/SCS transportation improvements are designed to fully support infill development along existing transit corridors seen in High Quality Transit Areas mapping in Appendix W of the SCS, and fully support the complementary transportation needs of the growing population. As a result, the proposed 2022 RTP/SCS would not induce growth beyond that anticipated by 2046; rather, it is intended to accommodate it by encouraging infill and TOD development within existing urban areas. Therefore, the proposed 2022 RTP/SCS is consistent with projected and planned growth. Further, all transportation improvement projects are anticipated by the general plans of the applicable local jurisdictions of the Planning Area, as all improvements have been coordinated with the applicable local jurisdiction.

5.2 Irreversible Effects

Section 15126.2(c) of the *State CEQA Guidelines* requires a discussion of significant irreversible environmental changes that would occur as a result of a proposed project. These may include current or future uses of nonrenewable resources and secondary or growth-inducing impacts that commit future generations to similar uses. CEQA requires that irretrievable commitments of resources be evaluated to ensure that such current consumption is justified.

Although the proposed 2022 RTP/SCS forecasts to a horizon year of 2046, transportation improvement projects would have an indefinite life span, assuming regular maintenance of the proposed improvements and long-term occupancy of infill and TOD projects. The proposed improvements would be located primarily in areas where transportation facilities already exist,

where transportation facilities are already planned, or where transportation facilities are needed to support the new land use patterns identified in the SCS. Therefore, most proposed transportation projects are not generally expected to dramatically alter development patterns in the County and projects would support planned future development patterns. the proposed 2022 RTP/SCS would provide a foundation for local, regional, and State officials in making decisions aimed at achieving a coordinated and balanced transportation system.

Many of the adverse impacts that could occur from implementation of the proposed 2022 RTP/SCS are short-term in nature resulting primarily from construction of the proposed transportation projects, urban infill, and TOD projects along existing corridors. Typical construction-related impacts can involve the following issues: noise, air quality, aesthetics and construction-related erosion and associated water quality impacts. In addition, as discussed in detail Section 4.5, *Energy*, though such materials would not be used in a wasteful manner, all construction activity would involve the use of non-renewable energy sources, potable water and building materials. The use of these resources during construction would increase demand and impact supplies across the SJCOG region.

Long-term irreversible environmental impacts are associated with increased asphalt or concrete paving and related direct and cumulative impacts to geology/soils, biological and cultural resources (historic resources); traffic circulation; and hydrology/water quality, as discussed in their respective sections of this DEIR. In addition, as discussed in Section 4.1, *Aesthetics*, the proposed 2022 RTP/SCS would contribute to an overall increase in the urbanized character of the region. This shift would incrementally increase demand for potable water, electricity and other resources. The supply versus demand for these resources is evaluated by service/utility providers; thus, impacts would be determined during project specific review and as part of the overall planning process addressing regional growth. Although mitigation measures have been prescribed in their respective environmental issue areas to minimize identified significant but mitigable impacts, in certain instances, as discussed in Section 6.3 below, some issues could remain significant with implementation of mitigation measures.

5.3 List of Significant and Unavoidable Impacts

As discussed in Sections 4.1 through 4.16 of the DEIR, implementation of the proposed 2022 RTP/SCS would result in the following significant and unavoidable impacts.

- Impact AES-1: adverse effect on a scenic vista, scenic resources within a state scenic highway
- Impact AES-2: degradation of existing visual character (non-urbanized areas)
- Impact AES-3: generation of new sources of light and glare
- Cumulative – Aesthetics (adverse effect on night sky lighting and changes in the visual environment)
- Impact AQ-2: net increase in criteria pollutants for which the project region is non-attainment under federal or state ambient air quality standards from construction activities
- Impact AQ-3: net increase in criteria pollutants for which the project region is non-attainment under federal or state ambient air quality standards from operational activities
- Impact AQ-5: exposure of sensitive receptors to substantial hazardous air pollutant concentrations
- Cumulative – Air Quality (fugitive dust and ozone precursor emissions during construction and exposure to substantial air pollutant concentrations/odors)

- Impact BIO-3: interference with wildlife movement
- Cumulative – Biological Resources (special-status species and their habitats and wildlife movement)
- Impact CR-1: disturbance of known or unknown historical resources
- Impact CR-2: disturbance of known and unknown archeological resources
- Cumulative – Cultural Resources (historical and archaeological resources)
- Impact GEO-5: disturbance of known and unknown paleontological resources
- Cumulative – Geology and Soils (paleontological resources)
- Impact GHG-1: Construction of the transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would generate GHG emissions that may have a significant impact on the environment
- Impact GHG-2: Proposed transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS would result in a net increase in GHG emissions by 2046 compared to the existing baseline conditions and would therefore have a significant impact on the environment
- Cumulative – Greenhouse Gas Emissions (conflict with applicable plans/policies)
- Impact HYD-2: Decrease groundwater supplies and interfere with groundwater recharge
- Cumulative – Hydrology and Water Quality (groundwater supplies)
- Impact N-1: Temporary increase in ambient noise levels and noise increases related to construction activities
- Impact N-2: Permanent increase in noise levels and noise increase
- Impact N-3: Excessive ground borne vibration levels from construction activities
- Impact N-4: Placement of sensitive receptors in areas with unacceptable noise levels
- Cumulative – Noise (exposure to excessive operational noise)
- Impact T-2: Increase in VMT per capita
- Cumulative – Transportation (increase in VMT)
- Cumulative – Wildfire (direct and indirect exposure to wildfire hazards)

This page intentionally left blank.

6 Alternatives

As required by Section 15126(d) of the State CEQA Guidelines, this EIR examines a reasonable range of alternatives to the proposed 2022 RTP/SCS. Section 15126.6 of the CEQA Guidelines requires that an EIR "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project and evaluate the comparative merits of the alternatives."

In addition, the CEQA Guidelines state the following:

- An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives that are infeasible. The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly discuss the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are (i) failure to meet most of the basic project objectives, (ii), infeasibility, or (iii) inability to avoid significant environmental impacts. (CEQA Guidelines Section 15126.6(a)(c).)
- "Feasible" means capable of being accomplished within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors. (CEQA Guidelines Section 15364.)

The primary objective of the Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) is to comply with applicable regulatory requirements, including California Transportation Commission (CTC) Guidelines and Senate Bill (SB) 375 regional greenhouse gas (GHG) reduction targets. SJCOG's specific objectives for the proposed 2022 RTP/SCS are to additionally ensure that the transportation system planned for the SJCOG region accomplishes the following:

- Serves regional goals, objectives, policies and plans.
- Responds to community and regional transportation needs.
- Promotes energy efficient, environmentally sound modes of travel and facilities and services.
- Promotes equity and efficiency in the distribution of transportation projects and services.

More specific objectives of the proposed 2022 RTP/SCS are listed in Section 2.2 of the Project Description.

Each scenario analyzed during the RTP/SCS process was developed according to a theme to help ensure that choices regarding land use and transportation investments were consistent with one another. Land use choices in each scenario included development patterns, such as where to locate new housing, new job centers, and new mixed-use areas relative to existing communities (e.g., infill vs. converted farmland or open space). They also considered the density of new development, which dictates the relative proportion of large-lot single-family housing to small-lot single-family

housing and multifamily housing, and complementary uses, such as locating new housing near services and employment centers. Transportation investment choices in a scenario included decisions about spending levels on new roadway capacity, roadway maintenance, transit, and alternative modes of travel (e.g., bike and pedestrian). The alternative land use and transportation scenarios modeled and analyzed by SJCOG are described in Appendix S of the proposed 2022 RTP/SCS and the preferred scenario (proposed project) is described in detail within Chapter 1, *Introduction, Chapter 2, Public Engagement*, and *Chapter 3, Policies and Strategies* of the proposed 2022 RTP/SCS, as well as Chapter 2 of this EIR.

6.1 Alternatives Development and Screening Process

During the development of the proposed 2022 RTP/SCS, SJCOG developed and evaluated scenarios that included various land use assumptions to see how each scenario could achieve the GHG targets established by CARB for the SJCOG region as well as other performance measures based on the proposed transportation system improvements and investments in the RTP. Extensive outreach with partner agencies, local jurisdictions, key stakeholders, and the public was ongoing throughout the proposed 2022 RTP/SCS planning process. Four scenarios were evaluated by SJCOG. The proposed 2022 RTP/SCS evaluated throughout this EIR is Scenario E. Alternative 1 is Scenario A, Alternative 2 is Scenario B, and Scenarios C and D are discussed under Section 6-3, *Alternatives Considered but Rejected*.

This alternatives analysis herein includes the following:

- **Alternative 1: No Project Alternative** (SCS Scenario A: Stay the Course). In this scenario, the region does not change course and makes investments based on the last regional plan. Growth occurs primarily in new growth areas identified in the region's General or Specific Plans. The prioritized land use strategies include the following:
  - Prioritize projects that make more efficient use of existing road network
  - Prioritize large employer recruitment
  - Improve access to safe and convenient walking and biking options
  - Prioritize projects that improve and expand access to public transit

  Transportation investments are focused on managed lanes, ACE Rail, enhanced bus rapid transit. The prioritized transportation strategies include the following:

  - Only transportation projects included in the 2018 RTP would be constructed (excludes projects listed in Table 6-1)
  - Prioritize expanding the roadway network
- **Alternative 2: Remake Centers and Corridors** (SCS Scenario B: Remake Centers and Corridors). Traditional employment centers and aging commercial corridors are remade into residentially-focused neighborhoods. Growth is focused on urban arterials, existing neighborhoods, and job centers. The prioritized land use strategies include the following:
  - Encourage infill development
  - Promote a broader range of housing types
  - Develop a regional trust fund dedicated to addressing housing issues

Transportation focus investments in transit and bike/ped for infill locations along existing arterials, improvements/maintenance to local arterials to facilitate new types of development. The prioritized land use strategies include the following:

- Prioritize "complete streets" projects throughout the region
- Greater prioritization on projects that improve and expand access to public transit

Each alternative is described and analyzed below to determine whether environmental impacts would be similar to, less than, or greater than those of the preferred scenario in the proposed 2022 RTP/SCS. As required by CEQA, this section also includes a discussion of the "environmentally superior alternative" among those studied.

6.2 Alternatives Considered but Rejected

The CEQA Guidelines state that an EIR should identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination (CEQA Guidelines Section 15126.2(c). Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are (i) failure to meet most of the basic project objectives, (ii), infeasibility, or (iii) inability to avoid significant environmental impacts (CEQA Guidelines Section 15126.6(c)).

For this EIR, two alternatives were considered by SJCOG and rejected as infeasible. These alternatives and the reasons for elimination are described below.

6.2.1 20 Minute Neighborhoods

The 20 Minute Neighborhoods Alternative (SCS Scenario C: 20 Minute Neighborhoods) plans new growth areas that are redesigned to accommodate a greater mix of uses and modes. Commercial uses develop in traditionally residential areas. This scenario provides a broader range of daily destinations close to home and prioritizes transportation investments in transit and bike/pedestrian facilities for new growth locations that improves internal circulation in these neighborhoods. In SJCOG modeling, this alternative had similar impacts to the proposed project for farmland and total land consumed, energy, and Total VMT, but greater impact on Prime Farmland and increased impacts to environmental justice (EJ) communities, land use, hazards, and noise due to the more compact development. Therefore, this alternative was rejected as it was not environmentally superior to the project and similar in impacts to the proposed project.

6.2.2 Commuter Villages

The Commuter Villages Alternative (SCS Scenario D: Commuter Villages) incentivizes household and employment growth in urban arterials near existing and planned regional rail stations and near existing and planned high quality transit hubs. Transportation priorities would reinforce transit-oriented development by focusing on first mile/last mile connections to transit hubs (rail and bus transfer hubs). In SJCOG modeling, this alternative had similar impacts to the proposed 2022 RTP/SCS for farmland, total land consumed, and VMT. Therefore, this alternative was rejected as it was not environmentally superior to the project and similar in impacts to the proposed project.

6.2.3 Aggressive VMT Reduction Alternative

Due to the nature of the SJCOG region, certain aggressive VMT reducing measures are infeasible. For example, the region has a high variability in residential density and has a large rural component, with substantially longer trip lengths and therefore higher VMT for those in rural areas and commuting outside the region. These commuter trips are not easily replaced by transit, as longer transit trip lengths typically require multiple stops and/or transfers, making commuting via transit less attractive. These industries require a high level of in-person work and are therefore not conducive to telecommuting.

There are also significant agriculture activities from farm workers making seasonal transient (field-to-field) trips and agriculture goods movements. These trips are not conducive to transit and often generate longer trip lengths and thus higher VMT. The VMT generated by these activities does not respond to VMT reduction strategies such as increased transit or telecommuting.

Other measures such as higher parking fees as well as tolling highway travel are only feasible in highly urbanized areas where increased transit services are available as an alternative mode. Therefore, an aggressive VMT reduction alternative was not considered as an alternative for detailed consideration in this EIR.

6.3 Alternative 1: Stay The Course

6.3.1 Description

Alternative 1, the Stay The Course Alternative, represents the region moving forward only building out using funded transportation projects within the four-year period of the Federal Transportation Improvement Program (FTIP). This means, it only includes transportation project that would be complete by the year 2026. As it relates to land use, Alternative 1 used the 2018 Preferred Scenario as the starting point and updated it to reflect more recent development trends, as discussed in interviews with local jurisdictions, but updated land use growth to better match general plans and/or area plans prepared since 2018. In this scenario, the region does not change course and makes investments based on the last regional plan. Growth occurs primarily in new growth areas identified in the region's General or Specific Plans and transportation investments are focused on managed lanes, ACE Rail, enhanced bus rapid transit. This scenario has the following prioritized strategies and policies:

Transportation:

- Only funded transportation projects within the four-year period of the FTIP are included, meaning transportation projects that would be complete by the year 2026 (projects are listed in Table 6-1)

Land Use:

- Prioritize projects that make more efficient use of existing road network
- Prioritize large employer recruitment
- Improve access to safe and convenient walking and biking options
- Prioritize projects that improve and expand access to public transit

Alternative 1 allocates 63 percent of its growth in new growth areas, 18 percent in established neighborhoods and employment areas, 11 percent in urban arterials, and 8 percent in high-quality transit areas. This alternative has an overall gross acre residential density of 5.3 units per acre with 32 percent multifamily housing growth.

Table 6-1 Transportation Projects Included in Alternative 1

Project ID	Location	Description
Caltrans		
SJ14-1004	SR 99/120 Connector Project Phase 1A	(Widen the eastbound SR 120 to southbound SR 99 connector ramp from one-lane to two-lanes; Remove the Austin Road overcrossing and replace with a new 4 lane structure spanning SR 99 and UPRR; Add a new connecting road from Austin Road to Woodward Ave and Moffat Blvd and modify the existing UPRR gated crossing at Woodward Ave; Temporarily close the Austin Road northbound entrance and southbound exit ramps, resulting in a partial interchange.)
SJ18-1002	SR 99/120 Connector Project Phase 1B	Widen the northbound SR 99 to westbound SR 120 connector ramp from one-lane to two-lanes; Add an auxiliary lane in the existing median of westbound SR 120 from Main Street to SR 99; Convert the existing 99/120 separation structure to two lanes and construct a new separation structure to serve the eastbound 120 to northbound 99 connector ramp.
City of Escalon		
SJ07-3013	Ullrey Avenue/McHenry Avenue Intersection	Reconstruct intersection, including addition of turn pockets, improvement of traffic signal and installation of train pre-emption system for UPRR railroad crossing.
SJ07-3011	SR 120/Brennan Ave Intersection	Intersection improvements
City of Lathrop		
SJ14-2004	SR 120 at Yosemite Ave/Guthmiller Road	Reconstruct interchange
SJ07-3014	Golden Valley Parkway	Construct new roadway parallel to I-5, 2 lanes from Brookhurst Blvd to Stewart Road
City of Lodi		
SJ07-1020	SR-99 at Turner Road	Reconstruct interchange to provide operational and safety improvements on SR-99 at Turner Road (PM 31.3/31.6)
SJ07-3018	Harney Lane	Widen from 2/3 lane collector to 4-lane divided arterial
City of Manteca		
SJ07-2009	SR-120 at McKinley Ave	Construct new interchange
SJ07-3023	Airport Way	Widen from 2 to 4 lanes
SJ11-3008	Airport Way	Widen from 2 to 4 lanes
SJ07-3027	Louise Avenue	Widen from 2 to 4 lanes
SJ11-3011	Atherton Drive	Construct new 4 lane roadway
SJ07-3024	Lathrop Road	Widen from 2 to 4 lanes
SJ11-3014	Raymus Expressway	Construct new 4 lane expressway
City of Ripon		
SJ11-3017	Jack Tone Road, Phase 1	Widen from 2 to 6 lanes
SJ11-3019	Garrison Road Gap Closure	Construct 2-lane extension of Garrison Road

Project ID	Location	Description
SJ07-3137	W. Ripon Road	Widen from 2 to 6 lanes
SJ14-3006	Canal Boulevard Extension	Construct 4-lane extension of Canal Boulevard
City of Stockton		
SJ07-3084	Morada Lane	Widen from 3 to 6 lanes
SJ07-3093	Alpine Avenue	Widen from 2 to 4 lanes with a middle turn lane. Construct curb, gutter, sidewalks and driveways
SJ11-3044	Arch Road	Widen from 2 to 6 lanes
SJ11-3045	Arch Road	Widen from 2 to 6 lanes
SJ07-3078	Maranatha Dr	Construction of new 4 lane road
SJ11-3062	Maranatha Dr	Construction of new 4 lane road
SJ11-3056	Lower Sacramento Rd	Widen from 4 to 6 lanes
SJ11-3039	Lower Sacramento Rd	Widen from 2 to 6 lanes
SJ11-3047	Eight Mile Rd	Widen from 2 to 4 lanes
SJ11-3048	Eight Mile Rd	Widen from 2 to 4 lanes
County of San Joaquin		
SJ11-3029	Howard Road	Passing lanes and channelization
SJ14-3005	Grant Line Road Corridor Improvements	Realign roadway and widen from 2 to 4 lanes with operational and safety improvements
SJ11-3031	Tracy Boulevard	Passing lanes and channelization
City of Tracy		
SJ14-2002	I-580 at International Pkwy/Patterson Pass Road	Reconstruct interchange
SJ18-3002	International Parkway	Widen from 2 to 4 lanes, including reconstruction of Delta-Mendota Canal and California Aqueduct bridges
SJ07-3110	Corral Hollow Road	Widen from 2 to 4 lanes
SJ22-3107	Grant Line Road	Widen from 3 to 4 lanes
SJ07-3181	Corral Hollow Road Widening	Widen 2 to 4 lanes including ROW and construction of two bridges

6.3.2 Impact Analysis

a. Visual Resources

Implementation of this alternative would result in fewer visual impacts as compared to the proposed 2022 RTP/SCS, because many of the proposed interchange improvements, auxiliary and transition lanes, new roadways and overcrossings and road extensions, would not be constructed (See Table 6-1). Nevertheless, many transportation projects would still be constructed under this alternative with the potential to impact scenic vistas on designated scenic highways. Over 5,000 acres of more land consumed under this alternative compared to the proposed project which may result in greater impacts to scenic resources in the less developed portions of the SJCOG region. Thus, impacts related to visual character would be significant and unavoidable for this alternative, as they would be with the proposed 2022 RTP/SCS. The overall level of impact resulting from combined transportation improvement and land use projects would be similar when compared to the proposed 2022 RTP/SCS with some impacts greater while other impacts less but would remain significant and unavoidable.

b. Air Quality

Implementation of this alternative would reduce short-term air quality impacts from construction activity, as fewer transportation projects would be implemented and therefore less construction activity would occur. Because emissions are directly correlated with VMT, it can be reasonably assumed that emissions for all pollutants would be equal to lower under the No Project Alternative compared to the proposed 2022 RTP/SCS as it has a slightly lower total VMT and per capita VMT compared to the proposed project. The land use scenario in the No Project Alternative would contribute to more new growth in undeveloped areas compared to that of the proposed RTP/SCS. Because the proposed 2022 RTP/SCS would emphasize infill development, Alternative 1 would likely result in more land development construction related air quality impacts related to dust and particulate matter.

Future land use development under this alternative would not be infill or transit-oriented development (TOD)-focused. As such, the No Project Alternative would not concentrate population adjacent to high quality transit areas and other transportation facilities that could result in more people being exposed to elevated health risks from Toxic Air Contaminants (TACs). Accordingly, impacts related to TAC exposure to sensitive receptors would be less under this alternative than under the proposed 2022 RTP/SCS but would remain significant and unavoidable.

Overall air quality impacts would be similar under this alternative when compared to the proposed 2022 RTP/SCS because VMT would be slightly lower under this alternative. Under this alternative, TACs would be reduced due to reduced development near transit and transportation facilities. However, long term operational impacts related exposure of sensitive receptors to substantial hazardous air pollutant concentrations and objectionable odors would remain significant and unavoidable, as they would be for the proposed 2022 RTP/SCS.

c. Biological Resources

Future transportation projects developed under this alternative would result in fewer impacts to biological resources, as fewer roadway extensions, widening projects, and creek crossings would occur under this alternative. However, because this alternative would continue current regional growth trends rather than emphasizing an infill approach to land use and housing, more development would be expected to occur outside of existing urbanized areas, including in areas providing habitat for special status plant and animal species. Overall impacts to special status plants, animals, wetlands and/or riparian habitat and wildlife movement outside developed urban areas would therefore be greater than under the 2022 RTP/SCS. Impacts would remain significant and unavoidable, as they would be for the proposed 2022 RTP/SCS.

d. Cultural Resources

As described in Section 4.5, *Cultural Resources,* some of the proposed 2022 RTP/SCS projects may be located in proximity to historical resources or include repair or replacement of potentially historical structures (e.g., bridges). Because fewer transportation projects would be developed under the No Project Alternative, these impacts would be reduced. In addition, because less infill development would occur under this alternative, fewer impacts involving redevelopment or demolition of existing structures resulting from land use development would occur. Impacts to historic resources would therefore be reduced when compared to the proposed 2022 RTP/SCS. However, project specific impacts may still be significant, as they are for the proposed 2022 RTP/SCS.

Implementation of this alternative would involve less ground disturbance associated with transportation improvements than would occur under the proposed 2022 RTP/SCS. However, because more land use development could occur outside of existing urbanized areas, more ground disturbance would be expected to occur in previously undeveloped areas. As such, the potential for uncovering known or unknown archaeological resources would increase under this alternative for new development but decrease for transportation projects. The overall level of impact resulting from combined transportation improvement and land use projects would be similar when compared to the proposed 2022 RTP/SCS assuming relative equalization between the historic and archaeologic impacts between the proposed 2022 RTP/SCS and Alternative 1. Impacts to archaeological resources would remain significant and unavoidable, as they are for the proposed 2022 RTP/SCS.

e. Energy

Because this alternative would result in less construction of transportation infrastructure, overall energy use associated with construction activities would be reduced when compared to the proposed 2022 RTP/SCS. However, this alternative would not include many of the capital improvements envisioned under the proposed 2022 RTP/SCS that would improve transportation efficiency and reduce regional energy demand, such as active transportation projects. Energy use will increase over time as the result of regional socioeconomic (population and employment) growth, regardless of implementation of the proposed 2022 RTP/SCS. The No Project Alternative would result in similar total and per capita energy use as compared to the proposed 2022 RTP/SCS. As discussed in Section 4.6, *Energy,* the proposed 2022 RTP/SCS would not result in inefficient, unnecessary, or wasteful direct or indirect consumption of energy, and would be consistent with applicable energy conservation policies. Because the No Project Alternative would be similar in both total and per capita energy use, impacts would be similar when compared to the proposed 2022 RTP/SCS and impacts related to inefficient, unnecessary, or wasteful direct or indirect energy consumption would be less than significant, as they are for the proposed 2022 RTP/SCS.

f. Agriculture and Forestry Resources

This alternative would result in fewer transportation projects being constructed, including roadway widening and other projects that could directly convert agricultural land to non-agricultural use. However, because this alternative would continue current growth trends rather than emphasizing an infill approach to land use and housing, more development would be expected to occur outside of existing urbanized areas, including within areas currently used for agricultural production. Given this land use trend and the extent of Important Farmland in the SJCOG region, impacts related to converting Important Farmland to non-agricultural use, conflicts between urban and agricultural land uses, and conflicts with existing agricultural zoning and/or Williamson Act contracts would be worse under this alternative than for the proposed 2022 RTP/SCS.

Because there is no identified forestland in the SJCOG region, there is no impact to forest or timberlands.

The overall impact to agriculture resources resulting from the No Build Alternative would be greater than under the 2022 RTP/SCS.

g. Environmental Justice

This alternative would result in fewer transportation projects being constructed, including roadway widening and other projects and would not emphasize an infill approach to land use and housing that could potentially impact, displace or divide an EJ community compared to the project.

However, because this alternative would continue current growth trends rather than emphasizing an infill approach to land use and housing, more development would be expected to occur outside of existing urbanized areas that are not near transit that EJ communities need for transportation.

Unlike the 2022 RTP/SCS, this alternative would not promote infill and mixed use development. Infill and mixed use development would improve mobility for low income and minority populations and communities of concerns because housing and jobs would be located within closer proximity to public transit facilities. Therefore, without this type of development, Alternative 1 may result in a smaller percentage of EJ populations having convenient access to mobility. Performance measures developed by SJCOG indicate that 25 percent fewer households in jobs-rich areas would be developed compared to the proposed 2022 RTP/SCS under Alternative 1, making access to jobs more difficult for EJ communities with limited transportation options.

Overall, implementation of Alternative 1 would result in similar impacts related to environmental justice than the proposed 2022 RTP/SCS with fewer impacts on potential displacement but also less access to transit and housing near jobs.

h. Geology and Soils

Impacts of this alternative related to erosion and loss of topsoil would be less than significant pursuant to compliance with existing regulations, similar to the proposed 2022 RTP/SCS. Because this alternative does not include as many new interchanges, roads and fixed facilities, there would be less exposure of new structures to hazardous geologic conditions, including expansive soils, landslides, ground-shaking, and flooding. Conversely, if inadequate structures are not replaced, the potential for these existing structures and people using these structures to be harmed by geologic hazards could be greater than under the proposed 2022 RTP/SCS. Implementation of this alternative would involve less ground disturbance associated with transportation improvements than would occur under the proposed 2022 RTP/SCS. However, because more land use development could occur outside of existing urbanized areas due to growth continuing under the existing land use pattern, more development would be expected to occur in previously undeveloped areas. While development under the No Project Alternative would also be required to comply with the California Building Code and requirements set forth by the Alquist Priolo Zone Act, the No Project Alternative would result in a greater area of land being converted from undeveloped to developed uses that could be located in areas with greater susceptibility to seismic related risks. Impacts related to susceptibility to seismic related risks would be less than significant, as under the proposed 2022 RTP/SCS.

Impacts to paleontological resources would be greater under this alternative compared to the proposed 2022 RTP/SCS, as greater amounts of ground disturbing activities would increase the potential for impacts that could result in significant and unavoidable impacts, greater than the proposed 2022 RTP/SCS.

Overall, impacts to geology and soils would be slightly greater compared to the proposed 2022 RTP/SCS with greater land disturbance but would remain less than significant. Impacts to paleontological resources would also be greater and would be significant and unavoidable.

i. Greenhouse Gas Emissions and Climate Change

The No Project Alternative would result in fewer impacts associated with GHG emissions during construction activities as fewer transportation infrastructure projects would be constructed compared to the proposed 2022 RTP/SCS. Also, operation of the No Project Alternative would

decrease per capita GHG emissions from 3.08 to 2.88 MT of CO_2e per person per year, a 6.5 percent decrease. The No Project Alternative, with less active transportation and transit projects and less compact land use pattern would promote less sustainable modes of travel, clean vehicle technologies and traffic operational improvements within the SJCOG region than the project. The overall impact of this alternative would be similar to the proposed project and remain significant and unavoidable.

j. Hazards and Hazardous Materials

This alternative would result in fewer infrastructure projects being constructed, thereby reducing hazardous material use, storage, and transportation resulting from construction of those projects. However, the volume of hazardous materials being transported to support land use development in the region would remain the same, as land use development would continue to occur under this alternative. Because future development under the No Project Alternative would be subject to applicable hazardous materials regulations and programs, impacts relating to routine transport, use, or disposal of hazardous materials; risk of upset and accident conditions; emissions within one-quarter mile of a school; and airport hazards would be less than significant, similar to the proposed 2022 RTP/SCS. Overall hazards and hazardous materials impacts would be similar under this alternative as under the proposed 2022 RTP/SCS.

k. Hydrology and Water Quality

This alternative would result in fewer transportation infrastructure projects being constructed. Therefore, this alternative would reduce water quality impacts resulting from construction-related erosion and sedimentation and would generate less water demand for dust suppression activities for transportation projects. These impacts would remain less than significant pursuant to compliance with existing regulations, as they are for the proposed 2022 RTP/SCS.

Because this alternative would continue current growth trends rather than emphasizing an infill approach to land use and housing, more development would be expected to occur outside of existing urbanized areas. As such, impervious surfaces would be expected to increase under this alternative. Because projects would be located in less developed areas, runoff would include fewer urban pollutants such as heavy metals from auto emissions, oil and grease than projects under the proposed 2022 RTP/SCS. However, because more development would occur in and therefore be adjacent to agricultural areas, runoff from those adjacent agricultural areas would contain more fertilizers and pesticides. While projects under this alternative may require more grading and vegetation removal, including in proximity to creeks, less infill development may result in less disturbance of soils on previously contaminated sites. As such, water quality in creeks may be more impacted, but water quality within urban areas may be less impacted. Because of these tradeoffs, the No Project Alternative would result in impacts to water quality that are overall comparable to the proposed 2022 RTP/SCS with some impacts greater while other impacts would be less; water quality impacts would remain less than significant, pursuant to compliance with existing regulations, as they are for the proposed 2022 RTP/SCS.

l. Land Use and Planning

As with the 2022 RTP/SCS, this alternative would not be anticipated to divide an established community. As noted in Section 4.12, *Land Use and Planning,* the 2022 RTP/SCS includes a list of planned and programmed projects including local and regional capital improvements that have been anticipated or accounted for in local general plans and regional, statewide, and federal

transportation improvement programs. In addition, the objective of the 2022 RTP/SCS is to provide for a comprehensive transportation system of facilities and services that meets public need for the movement of people and goods, and that is consistent with the social, economic, and environmental goals and policies of the region. The No Project Alternative would not provide the same number of capital improvements anticipated within applicable general plans and transportation improvement programs, nor would it guide development to explicitly meet social, economic, and environmental goals and policies of the region as anticipated under the 2022 RTP/SCS. Due to the more dispersed land use pattern, the amount of undeveloped land impacted would be greater under this alternative.

Although the No Project Alternative would continue existing land use patterns and trends, it would increase the severity of several environmental impacts, as discussed herein. As such, it could result in conflicts with State and local policies and regulations adopted for the purpose of avoiding or mitigating environmental effects. Because environmental effects would generally increase under this alternative, the overall impacts on land use would be greater under this alternative when compared to the 2022 RTP/SCS but would remain less than significant.

m. Noise

From a programmatic perspective, fewer transportation infrastructure projects would result in less construction activity under the No Project Alternative. This would reduce temporary noise impacts throughout the SJCOG region. In addition, because the number of infill or TOD projects would be less under the No Project Alternative, construction-related noise impacts on adjacent sensitive receptors would also decrease. However, construction noise would still occur, and impacts would continue to be significant, as they are for the proposed 2022 RTP/SCS.

Although the number of transportation projects would be reduced as compared to the 2022 RTP/SCS, increased traffic volumes resulting from regional growth would continue to occur. Whether noise impacts would be greater or less than those anticipated under the 2022 RTP/SCS remains dependent on site specific considerations that cannot currently be known. Regionally, the difference in VMT between the No Project Alternative and the proposed 2022 RTP/SCS (66,215 difference in Total Annual VMT in 2046 distributed across the entire network) is not enough to noticeably change overall noise levels in the SJCOG region. Mobile source noise levels resulting from traffic would therefore be similar under the No Project Alternative when compared to the proposed 2022 RTP/SCS and would remain significant and unavoidable. Overall, noise-related impacts across the region would be similar to the proposed 2022 RTP/SCS and would continue to be significant and unavoidable.

n. Transportation

This alternative would not include many of the projects envisioned under the proposed 2022 RTP/SCS as listed above, including new highway and intersection projects, new bikeway and pedestrian projects (active transportation), new railroad projects, new transit projects, new intelligent transportation system/transportation demand management projects and aviation projects. Many of these projects are intended to address VMT, and in many cases would serve as mitigation measures to reduce potential impacts associated with planned long-term development.

Overall, VMT within the SJCOG region would increase from the baseline 2016 VMT of 17,015,116 as a result of regional population growth, regardless of implementation of the 2022 RTP/SCS. Under the No Project Alternative, total VMT in the SJCOG region would increase less than for the proposed

project. The decrease would be from 23,495,442 under the 2022 RTP/SCS to 23,429,227 – a decrease of 66,215 Total VMT, or 0.3 percent reduction from the proposed project.

Under the No Project Alternative, projects to increase bus capacity on congested facilities and the frequency of bus lines would not be implemented. Additionally, the proposed 2022 RTP/SCS projects that are intended to ensure a reliable bus fleet would not be implemented under the No Project Alternative. Without these types of projects, operation of public transit may be unreliable or fail to meet the frequency and performance standards established by the transit agencies in the SJCOG region. Thus, compared to the proposed 2022 RTP/SCS, the No Project Alternative would have a greater adverse impact on transit service in the SJCOG region with less dense development and less transit projects being funded.

Overall, the No Project Alternative would result in decreased daily VMT in the SJCOG region compared to the proposed 2022 RTP/SCS and have an adverse impact to transit service as projects to increase capacity on congested facilities and bus lines would not be implemented. Thus, overall, impacts to transportation would be similar under the No Project Alternative and would remain significant and unavoidable.

o. Tribal Cultural Resources

Implementation of this alternative would involve less ground disturbance associated with transportation improvements than would occur under the proposed 2022 RTP/SCS. However, because more land use development could occur outside of existing urbanized areas, more ground disturbance would be expected to occur in previously undeveloped or open space areas. As such, the potential to disturb tribal cultural resources, including ancestral remains and sacred sites, would increase under this alternative. Future projects would be required to comply with AB 52, which may require formal tribal consultation. Compliance with this requirement would reduce impacts to a less than significant level, similar to the proposed 2022 RTP/SCS. However, because of the increased potential to disturb tribal cultural resources from development outside of urbanized areas and no mitigation applicable to this alternative, the overall impact of the No Project Alternative would be greater than under the proposed 2022 RTP/SCS.

p. Wildfire

The No Project Alternative would allow more housing near wildlands and would increase the vulnerability of people and structures to wildland fire. Under the No Project Alternative land use development could occur outside of existing urbanized areas and extend into more wildland areas. This impact, which is significant and unavoidable for the proposed 2022 RTP/SCS, would be greater under the No Project Alternative and would remain significant and unavoidable.

6.4 Alternative 2: Remake Centers and Corridors

6.4.1 Description

Alternative 2, the Remake Centers & Corridors, would focus on growth on urban arterials, existing neighborhoods, and job centers. Traditional employment centers and aging commercial corridors are remade into residentially-focused neighborhoods. Growth is focused on urban arterials, existing neighborhoods, and job centers. The prioritized land use strategies and policies include the following:

- Encourage infill development

- Promote a broader range of housing types
- Develop a regional trust fund dedicated to addressing housing issues

Transportation focus investments in transit and bike/ped for infill locations along existing arterials, improvements/maintenance to local arterials to facilitate new types of development. The prioritized land use strategies and policies include the following:

- Prioritize "complete streets" projects throughout the region
- Greater prioritization on projects that improve and expand access to public transit

Compared to the proposed 2022 RTP/SCS, Alternative 2 would increase gross residential density by 8.8 percent, be three percent higher for households in jobs-rich areas and include 47 percent more dwelling units at 20+ units per acre. In addition, it would consume 17,394 acres of land (a reduction of 2,932 acres) compared to the proposed 2022 RTP/SCS with 2,914 less acres of Prime Farmland impacted.

Alternative 2 allocates 27 percent of its growth in new growth areas, 24 percent in established neighborhoods and job centers, 30 percent along arterials, and 20 percent in high quality transit areas.

6.4.2 Impact Analysis

a. Visual Resources

This alternative would include greater development intensities around urban arterials and new growth areas where there would be the potential to impact scenic vistas on designated scenic highways. Higher density housing in transit areas and urban centers would have would occur in many parts of the SJCOG region, potentially changing current viewsheds. Land use development envisioned under this alternative would be denser than the proposed 2022 RTP/SCS and would result in greater aesthetic impacts to scenic resources in the developed portions of the SJCOG region. As land use development would be denser in infill areas, there would be less development in scenic viewshed areas, and this alternative would result in fewer changes in character from rural to urban. Impacts to scenic resources would be less under this alternative compared to the proposed 2022 RTP/SCS. Nevertheless, impacts related to visual character would be significant and unavoidable as with the proposed 2022 RTP/SCS. While the overall level of impact resulting from land use projects would be less when compared to the proposed 2022 RTP/SCS, impacts would remain significant and unavoidable.

b. Air Quality

Under this alternative, the land use development pattern would have higher densities in urban areas near transit. As such, it is likely that more sensitive receptors would be exposed to health risks from TACs during construction or operation. As a result, exposure to substantial hazardous air pollutant concentrations and objectionable odors would remain significant and unavoidable, as under the proposed 2022 RTP/SCS.

This alternative would reduce VMT more than the proposed project, and therefore would reduce air pollutant emissions when compared to the proposed RTP/SCS including CO_2, (30,175 metric tons/yr.) and $C0_2e$ (30,808 metric tons/yr.) (Appendix A). Impacts overall would be less than the proposed 2022 RTP/SCS but would remain significant and unavoidable.

c. Biological Resources

This alternative would further emphasize an infill approach to land use and housing. As with the proposed 2022 RTP/SCS, development would primarily occur in already urbanized areas and would not result in development of areas that provide habitat for special status plant and animal species. Overall impacts to special status plants, animals, wetlands and/or riparian habitat and wildlife movement outside developed urban areas would therefore be reduced when compared the proposed 2022 RTP/SCS. However, impacts would remain significant and unavoidable.

d. Cultural Resources

As described in Section 4.5, *Cultural Resources,* some of the proposed 2022 RTP/SCS projects may be located in proximity to historical resources or include repair or replacement of potentially historical structures (e.g., bridges). Under this alternative, all of the projects that would include repair or replacement of potentially historic resources would still occur. Impacts to historical resources would therefore be similar compared to the proposed 2022 RTP/SCS. Land use development impacts under this alternative could be greater as there is greater potential to redevelop and demolish historic structures in urbanized areas.

Land use development would be at a denser rate requiring less ground disturbance activities than under the proposed 2022 RTP/SCS. As such, the potential for uncovering known or unknown archaeological resources as a result of land use development would be reduced under this alternative. Although overall archaeological resources impacts would be reduced, the potential would remain for unearthing known or previously unidentified resources. As such, overall impacts would be similar to the proposed project and remain significant and unavoidable.

e. Energy

Energy use will increase over time as the result of regional socioeconomic (population and employment) growth, regardless of implementation of the proposed 2022 RTP/SCS. As discussed in Section 4.5, *Energy,* the proposed 2022 RTP/SCS would not result in inefficient, unnecessary, or wasteful direct or indirect consumption of energy, and would be consistent with applicable energy conservation policies. Because this alternative would reduce vehicular travel as shown through reduced VMT, energy use would be reduced. Impacts related to inefficient, unnecessary, or wasteful direct or indirect energy consumption would be reduced when compared to the proposed 2022 RTP/SCS and would similarly remain less than significant.

f. Agriculture and Forestry Resources

Land use development under this alternative would further concentrate higher density housing in transit and urban areas. Impacts from land use projects converting agricultural resources would have less impacts compared to the proposed 2022 RTP/SCS, as development would not extend into agricultural land to the same extent. As a result, Alternative 2 would convert 2,914 fewer acres of Prime Farmland than the proposed 2022 RTP/SCS, a decrease of 72 percent. This impact would be less than for the proposed 2022 RTP/SCS but would remain significant and unavoidable because some development on Prime Farmland could still occur.

g. Environmental Justice

Alternative 2 would include greater development intensities around transit and within urban centers. Higher density housing in transit areas and urban centers would have the potential to

displace existing EJ communities where the new development would occur but also provide an increased access to transit to EJ communities through higher density development along transportation corridors. This alternative would provide more housing in jobs-rich areas, 4 percent more than the proposed project. This alternative would also provide 47 percent more housing at 20-plus units per acre, providing an even greater mix of housing type allows for a greater range of options for all populations, including EJ populations, and also provides for a greater range of housing affordability compared to the proposed project. Overall, implementation of Alternative B would reduce impacts related to environmental justice compared to the proposed 2022 RTP/SCS with better access to transit, affordable housing, and housing near jobs.

h. Geology and Soils

Similar to the proposed 2022 RTP/SCS, this alternative would replace inadequate existing structures, such as existing buildings and bridges, and would reduce the potential for these existing structures and people using these structures to be harmed by geologic hazards and would be the same as the proposed 2022 RTP/SCS. Development under Alternative 2 would also be required to comply with the California Building Code and requirements set forth by the Alquist Priolo Zone Act. Overall, seismic related impacts would be similar to the proposed 2022 RTP/SCS. Implementation of mitigation measures, as under the proposed 2022 RTP/SCS, would still be required and impacts would remain significant and unavoidable.

Impacts to paleontological resources would be less under this alternative compared to the proposed 2022 RTP/SCS as development outside of urbanized areas would be less, but would still result in significant and unavoidable impacts, similar to the proposed 2022 RTP/SCS. Impacts to paleontological resources would be significant and unavoidable but would be reduced under this alternative.

i. Greenhouse Gas Emissions and Climate Change

Alternative 2 would likely result in fewer impacts associated with GHG emissions during construction activities for transit projects as the scale of construction would be smaller. Additionally, operational GHG impacts would likely decrease because the increased housing density envisioned by this alternative would reduce the need for a personal vehicle and subsequently reduce VMT. This compact development would also increase the effectiveness of public transit and multimodal transportation networks, which could further reduce GHG emissions beyond the proposed 2022 RTP/SCS. This alternative would decrease per capita GHG emissions of 30,808 MT of CO_2e per person per year, a 1.0 percent decrease compared to the proposed project. This alternative would also provide greater access to transit and active transportation projects, further reducing GHG emissions. Therefore, GHG impacts would be less as compared to the proposed 2022 RTP/SCS but would remain significant and unavoidable.

j. Hazards and Hazardous Materials

This alternative would result in similar infrastructure projects being constructed, thereby having similar hazardous material use, storage and transportation resulting from construction of those projects. The volume of hazardous materials being transported to support land use development in the region would be less given the infill rate of the alternative. Because Alternative 2 would be subject to existing regulations and programs, impacts relating to routine transport, use, or disposal of hazardous materials; risk of upset and accident conditions; emissions within one-quarter mile of a school; airport hazards; and interference with emergency response and evacuation plans would be

less than significant, similar to the proposed 2022 RTP/SCS. Overall hazards and hazardous materials impacts would be less under this alternative instead of the proposed 2022 RTP/SCS.

k. Hydrology and Water Quality

This alternative would further emphasize an infill approach to land use and housing. As such, land development would result in fewer impervious surfaces than would be expected under the proposed 2022 RTP/SCS. Nonetheless, infill development would generate runoff that would include urban pollutants such as heavy metals from auto emissions, oil, and grease, similar to projects under the proposed 2022 RTP/SCS. Therefore, impacts to water quality would be less than those of the proposed 2022 RTP/SCS because less development would occur that would result in additional impervious surfaces compared to the proposed project. Infill development would generate runoff that would include urban pollutants similar such as heavy metals from auto emissions, oil, and grease, similar to the proposed 2022 RTP/SCS. Therefore, overall impacts to water quality would be less compared to the proposed 2022 RTP/SCS and impacts would remain significant and unavoidable.

l. Land Use and Planning

As noted in Section 4.12, *Land Use and Planning,* the proposed 2022 RTP/SCS includes a list of planned and programmed projects including local and regional capital improvements that have been anticipated or accounted for in local general plans and regional, statewide, and federal transportation improvement programs. Higher density housing in urbanized areas, primarily infill, would be anticipated to result in greater conflicts with local land use plans as this alternative would prioritize higher density beyond existing growth projections and would be inconsistent with growth projections of local General Plans and Specific Plans.

Development under this alternative would be concentrated in urbanized areas and would consist of primarily infill projects. As such, the land use pattern under this alternative would not result in the physical division of communities and impacts would be similar to the proposed 2022 RTP/SCS.

Development under this alternative could conflict with land use plans, policies, and programs through the shifting of residential development into commercial urban areas and corridors requiring change in zoning or land use designations. As such, implementation of this alternative would conflict with State and local policies and regulations adopted for the purpose of avoiding or mitigating environmental effects.

Under this alternative, impacts related to physically dividing an established community would be similar and impacts due to a conflict with any land use plan, policy, or regulation would be greater and overall greater when compared to the proposed 2022 RTP/SCS and would remain less than significant.

m. Noise

Land use development under this alternative would occur primarily in infill and TOD areas. As such, increased noise levels from increased transit onto development in the area would be greater than under the proposed 2022 RTP/SCS and would result in more sensitive receivers exposed to greater sound levels. Increased ambient noise levels for sensitive receivers in these areas would be significant and unavoidable under this alternative, as it is for the proposed 2022 RTP/SCS.

Noise would generally be the same as compared to the proposed 2022 RTP/SCS, as cumulative regional traffic volumes would increase regardless of implementation of the proposed 2022 RTP/SCS

or this alternative. Whether noise impacts would be greater or less than those anticipated under the proposed 2022 RTP/SCS remains dependent on site specific considerations that cannot currently be known. Regionally, the difference in VMT between the proposed 2022 RTP/SCS and Alternative 2 is not enough to noticeably change overall noise levels in the region. Mobile source noise levels resulting from traffic would be slightly less under Alternative 2 than the proposed 2022 RTP/SCS as this alternative would result in less VMT.

Construction and operation of future development under this alternative could be located in close proximity to a public airport or private airstrip, as under the proposed 2022 RTP/SCS, and would result in exposure of people residing or working in the area to excessive noise levels. As under the proposed 2022 RTP/SCS, this alternative could result in the exposure of people residing or working near public airports or private airstrips to excessive noise levels. Mitigation measures identified in Section 4.13, *Noise,* would continue to be required under this alternative and impacts would be similar as under the proposed 2022 RTP/SCS and would remain significant and unavoidable. Overall, noise-related impacts across the region would be similar to the proposed 2022 RTP/SCS and would continue to be significant and unavoidable.

n. Transportation

This alternative incorporates less dispersed land use and development and a more compact growth footprint than the proposed 2022 RTP/SCS, and increased use of regional transit service to generate an increase in regional transit ridership and corresponding decrease in VMT. Alternative 2 would generate 97,559 less total VMT in 2046 compared to the proposed project, 0.4 percent reduction. Impacts related to conflicts with any program, plan, ordinance, or policy addressing the circulation system or inconsistency with CEQA Guidelines section 15064.3, increasing a hazard, or regarding emergency access or emergency response plan, would be similar between Alternative 2 and the proposed project.

Overall, this alternative would reduce transportation related impacts compared to the proposed 2022 RTP/SCS. However, because VMT would still be above adopted thresholds, impacts would remain significant and unavoidable.

o. Tribal Cultural Resources

Under this alternative, land use development would occur in infill areas to a greater extent than the proposed 2022 RTP/SCS. Higher density development within already urbanized areas would reduce ground disturbance, as less disturbance would occur outside these areas. As such, the potential to disturb tribal cultural resources, including ancestral remains and sacred sites, would decrease under this alternative. Future projects would still be required to comply with AB 52, which would encourage tribal consultation with local California Native American tribes and require the identification of project specific substantial adverse effects on tribal cultural resources and appropriate project specific mitigation measures. If it is determined that a specific project would result a substantial adverse change in the significance of a tribal cultural resource, the impact would be significant. Therefore, impacts would be significant and unavoidable, as they would be for the proposed 2022 RTP/SCS but would be reduced compared to the proposed 2022 RTP/SCS due to the reduced level of ground disturbance outside of urban areas.

p. Wildfire

The land use pattern under this alternative would construct higher density housing in urban areas which would reduce the amount of land development within and near wildland urban interface

areas. However, there is still the potential for development under this alternative to result in exacerbated wildfire risk. Exacerbated wildfire risk would result in additional impacts related to flooding, landslides, and other associated hazards. Under this alternative, mitigation would still be required; however, impacts would still be significant and unavoidable, as under the proposed 2022 RTP/SCS.

While development of both land use and transportation structures under this alternative would still be required to comply with the California Fire Code, and mitigation would still be required, impacts under this alternative would remain significant and unavoidable as potential risks from wildfire cannot be feasibly reduced to less than significant. Overall, wildfire impacts would be reduced when compared to the proposed 2022 RTP/SCS but would remain significant and unavoidable.

6.5 Environmentally Superior Alternative

State CEQA Guidelines Section 15126.6 requires that an EIR identify the environmentally superior alternative among the alternatives analyzed. Section 15126.6(d)(2) states that if the No Project Alternative is identified as the environmentally superior alternative, the EIR shall also identify an environmentally superior alternative from among the other alternatives analyzed. This section compares the impacts of the two alternatives under consideration to those of the proposed 2022 RTP/SCS in compliance with the *State CEQA Guidelines*.

Table 6-2 shows whether each alternative would have impacts that are less than, similar to, or greater than the proposed 2022 RTP/SCS for each of the issue areas studied.

Based on the above analysis and summary in Table 6-2, Alternative 2 is the environmentally superior alternative, assuming all environmental issue areas are weighted equally. Under Alternative 2, land use patterns would be concentrated in infill and TOD areas. Alternative 2 would result in a higher density development pattern than the proposed 2022 RTP/SCS. This results in Alternative 2 reducing VMT to a greater extent than the proposed 2022 RTP/SCS. This VMT reduction would also result in less generation of criteria pollutants and GHG emissions compared to the project. Alternative 2 could be considered environmentally superior to the proposed 2022 RTP/SCS primarily because, as shown in Table 6-2, overall impacts to the following resources would be less: air quality , biological resources, energy, agriculture resources, environmental justice, geology and soils, greenhouse gas emissions, hazards, hydrology, transportation (VMT), tribal resources, and wildfire.

The No Project Alternative (Alternative 1) would result in a less dense development pattern compared to the proposed 2022 RTP/SCS, as it would continue existing land use trends. Because of the increased land development outside of existing urbanized areas, Alternative 1 would result in more ground disturbance than the proposed 2022 RTP/SCS. Consequently, compared to the proposed 2022 RTP/SCS, Alternative 1 would have greater overall impacts to, biological resources, agricultural resources, geology and soils, land use, transportation, tribal cultural resources, and wildfire. As shown in Table 6-2, Alternative 1 would result in greater impacts than the proposed 2022 RTP/SCS, although it would reduce VMT emissions compared to the proposed project, but not to the extent Alternative 2 does. It would also fail to meet most basic project objectives promote equitable access opportunities, provide a mix of land uses and compact development patterns and encourage infill development to preserve agricultural land and natural resources, and maintain or reduce congestion as compared to current levels.

The proposed project was selected over Alternative 2 as overall, it was determined to better meet the identified objectives developed by SJCOG in preparing the RTP/SCS. The proposed project better

serves regional goals, objectives, policies and plans of the County and the cities in the SJCOG region, better meets community and regional transportation needs while still promoting energy efficient, environmentally sound modes of travel and facilities and services, and promotes equity and efficiency in the distribution of transportation projects and services. Although Alternative 2 is identified as environmentally superior most impacts were still identified as being significant and unavoidable. The proposed project was equal to Alternative 2 regarding cultural resources and noise, and less environmental impacts regarding land use and planning.

Table 6-2 Impact Comparison of Alternatives

Issue Area	Proposed 2022 RTP/SCS	Alternative 1: No Project Alternative	Alternative 2: Remake Centers and Corridors
Visual Resources	SU	=	<
Air Quality	SU	<	<
Biology	SU	>	<
Cultural Resources	SU	=	=
Energy	LTS	=	<
Agriculture and Forestry	SU	>	<
Environmental Justice	SU	=	<
Geology and Soils	SU	>	<
Greenhouse Gas Emissions and Climate Change	SU	=	<
Hazards and Hazardous Materials	LTS	=	<
Hydrology and Water Quality	SU	=	<
Land Use and Planning	LTS	>	>
Noise	SU	=	=
Transportation	LTS	>	<
Tribal Cultural Resources	LTS	>	<
Wildfire	LTS	>	<

Note: Comparison of impacts is based on the overall impact of the alternative on the resource or issue.

< Alternative impacts would be less than those of the proposed 2022 RTP/SCS

= Alternative would result in impacts similar to the proposed 2022 RTP/SCS

> Alternative impacts would be greater than those of the proposed 2022 RTP/SCS

This page intentionally left blank.

7 References

7.1 Bibliography

Project Description

California Transportation Commission (CTC). 2017. 2017 Regional Transportation Plan Guidelines for Regional Transportation Planning Agencies. January 18, 2017. https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/2017rtpguidelinesforrtpas-a11y.pdf (accessed June 2022).

Visual Resources

California Department of Transportation [Caltrans]. 2019. Scenic Highways. https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways (accessed March 2022).

Escalon, City of. 2019. City of Escalon General Plan. http://cityofescalon.org/government/departments/development_services/planning/general_plan (accessed March 2022).

Lathrop, City of. 1991. Comprehensive General Plan. https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/planning_division/page/5251/general_plan_11-9-04_-_entire_doc.pdf (accessed March 2022).

Lodi, City of. 2010. Lodi General Plan. https://www.lodi.gov/DocumentCenter/View/199/Final-General-Plan---Entire-Document-PDF (accessed March 2022).

Manteca, City of. 2003. General Plan 2023. https://www.ci.manteca.ca.us/CommunityDevelopment/Documents/City%20of%20Manteca%20General%20Plan.pdf (accessed March 2022).

Ripon, City of. 2006. General Plan. http://p1cdn4static.civiclive.com/UserFiles/Servers/Server_1080027/File/City%20Hall/City%20Government/Documents/Development/General%20Plan%202040%20Chapters.pdf (accessed March 2022).

San Joaquin, County of. 2016. San Joaquin County General Plan. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/planning/general%20plan%202035/general%20plan%202035.pdf (accessed March 2022).

_____. 2014. San Joaquin County General Plan Environmental Impact Report. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/Environmental%20Impact%20Reports/GENERAL%20PLAN%202035%20-%20DRAFT%20EIR.pdf (accessed March 2022).

Stockton, City of. 2018. Envision Stockton 2040 General Plan. http://www.stocktonca.gov/files/Adopted_Plan.pdf (accessed March 2022).

Tracy, City of. 2011. City of Tracy General Plan. https://www.cityoftracy.org/home/showpublisheddocument/904/637451218786230000 (accessed March 2022).

U.S. Federal Highway Administration. 2022. Byways. https://www.fhwa.dot.gov/byways (accessed March 2022).

Air Quality

_____. 2005. Air Quality and Land Use Handbook: A Community Health Perspective. April. https://www.arb.ca.gov/ch/handbook.pdf. (accessed May 2022)

_____. 2016. Ambient Air Quality Standards. Last Modified May 4, 2016. https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf. (accessed May 2022)

_____. 2021a. Overview: Diesel Exhaust & Health. n.d. https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health. (accessed May 2022)

_____. 2021b. Governor Newsom's Zero-Emission by 2035 Executive Order (N-79-20). https://ww2.arb.ca.gov/resources/fact-sheets/governor-newsoms-zero-emission-2035-executive-order-n-79-20. (accessed May 2022)

_____. 2021c. Non-road Diesel Engine Certification Tier Chart. N.d. https://ww2.arb.ca.gov/resources/documents/non-road-diesel-engine-certification-tier-chart. (accessed May 2022)

_____. 2022. *Top 4 Summary: Select Pollutant, Years, & Area*, iADAM: Air Quality Data Statistics. [database]. N.d. https://www.arb.ca.gov/adam/topfour/topfour1.php (accessed May 2022)

Iowa Environmental Mesonet. 2021. Stockton Metro Windrose Plot. https://mesonet.agron.iastate.edu/sites/windrose.phtml?station=SCK&network=CA_ASOS (accessed May 2022).

JDSupra. 2021. Beverage and Diamond PC. February 11, 2021. D.C. Circuit Stays Litigation over EPA Rescission of California Waiver to Regulate Vehicle Emissions. Available: https://www.jdsupra.com/legalnews/d-c-circuit-stays-litigation-over-epa-1845485/. (accessed February 2022)Porterville, City of. 2002. General Plan. https://cms9files.revize.com/PortervilleCA/Document_Center/Department/Community%20Development/General%20Plan%20Update/Chapter6OpenSpaceandConservation_000.pdf (accessed May 2022)

National Highway Traffic Safety Administration. 2022. March 31, 2022. NHTSA Finalizes CAFÉ Standards for MYs 2024-2026. https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy (accessed May 2022)

San Joaquin, County of. 2016. San Joaquin County General Plan Policy Document. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan%202035/GENERAL%20PLAN%202035.pdf (accessed June 2022)

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2015a. Guide for Assessing and Mitigating Air Quality Impacts, March 19, 2015. http://valleyair.org/transportation/GAMAQI.pdf. (accessed May 2022)

_____. 2015b. Land-Use Design Elements and Mitigation Measures. 2015. http://www.valleyair.org/transportation/Mitigation-Measures.pdf (accessed May 2022)

_____. 2016. 2016 Ozone Plan for 2008 8-Hour Ozone Standard. July 2016. http://valleyair.org/Air_Quality_Plans/Ozone-Plan-2016/Adopted-Plan.pdf (accessed May 2022)

_____.2018a. Ambient Air Quality Standards & Valley Attainment Status. www.valleyair.org/aqinfo/attainment.htm (accessed May 2022)

_____.2018b. 2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards. http://www.valleyair.org/pmplans/documents/2018/pm-plan-adopted/2018-Plan-for-the-1997-2006-and-2012-PM2.5-Standards.pdf (accessed May 2022)

_____. 2021a. Air Monitoring Sites in Operation https://ww2.valleyair.org/media/sfulfqtz/airmonitoring_aqa-2021.jpg (accessed May 2022)

_____.2021b. Attainment Plan Revisions for 1997 Annual PM2.5 Standard. August 2021. https://ww2.valleyair.org/media/spjlsext/attainment-plan-revision.pdf (accessed May 2022)

Stockton, City of. 2018. Envision Stockton 2040. http://www.stocktonca.gov/files/Adopted_Plan.pdf (accessed June 2022)

Tracy, City of. 2011. City of Tracy General Plan. https://www.cityoftracy.org/home/showpublisheddocument/374/637449291161070000 (accessed June 2022)

United States Environmental Protection Agency (U.S. EPA). 2016. Nonroad Compression-Ignition Engines: Exhaust Emission Standards. March. https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA05.pdf. (accessed May 2022)

_____. 2021a. “Criteria Air Pollutants. N.d. https://www.epa.gov/criteria-air-pollutants. (accessed May 2022)

_____. 2021b. California Nonattainment/Maintenance Status for Each County for All Criteria Pollutants. Last Updated July 31, 2021. https://www3.epa.gov/airquality/greenbook/anayo_ca.html. (accessed May 2022)

Western Regional Climate Center. 2016. Period of Record Monthly Climate Summary. https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca8560 (accessed May 2022).

Biological Resources

California Department of Fish and Wildlife (CDFW). 2014. California Wildlife Habitat Relationships. California Interagency Wildlife Task Group.

_____. 2020. List of Vegetation Alliances and Associations. Vegetation Classification and Mapping Program, Sacramento, CA. September 9, 2020. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153609&inline. (accessed November 2021).

_____. 2021a. California Natural Diversity Database (CNDDB). Rarefind V 5.2.14. (online). https://apps.wildlife.ca.gov/rarefind/view/RareFind.aspx. (accessed November 2021).

_____. 2021b. Biogeographic Information and Observation System (BIOS). https://apps.wildlife.ca.gov/bios/. (accessed November 2021).

California Native Plant Society (CNPS), Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v9-01 0.0). https://www.rareplants.cnps.org. (accessed November 2021).

Conservation Corridor. 2021. Corridor Concerns website. Available at: https://conservationcorridor.org/corridor-concerns/. (accessed November 2021).

Federal Geographic Data Committee (FGDC). 2008. National Vegetation Classification Standard, Version 2 FGDC-STD-005-2008. Vegetation Subcommittee, FGDC Secretariat, U.S. Geological Survey. Reston, VA. 55 pp. + Appendices.

Jennings M.D., D. Faber-Langendoen, O.L. Loucks, R.K. Peet, and D. Roberts. 2009. Standards for associations and alliances of the US National Vegetation Classification. Ecological Monographs 79:173–199.

Mayer, K. E., and W. F. Laudenslayer. 1988. A Guide to Wildlife Habitats of California. California Department of Fish and Game, Sacramento, CA.

San Joaquin Council of Governments (SJCOG). 2000. San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP). https://ca-sjcog2.civicplus.com/DocumentCenter/View/5/Habitat-Planpdf?bidId=. (accessed November 2021).

San Joaquin, County of. 2016. General Plan 2035. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan%202035/GENERAL%20PLAN%202035.pdf (accessed February 2022).

Sawyer, J. O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, California.

Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

Stockton, City of. 2018. Envision Stockton 2040 General Plan. Adopted December 4, 2018. http://www.stocktongov.com/files/Adopted_Plan.pdf. (accessed February 2022).

State Water Resources Control Board (SWRCB). 2021. State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. (accessed December 2021).

Tracy, City of. 2011. General Plan 2025. Adopted February 1, 2011. https://www.cityoftracy.org/home/showpublisheddocument/374/637449291161070000 (accessed February 2022).

United States Environmental Protection Agency (USEPA). 2021. Background about Compensatory Mitigation Requirements under CWA Section 404. https://www.epa.gov/cwa-404/background-about-compensatory-mitigation-requirements-under-cwa-section-404. (accessed November 2021).

U.S. Fish and Wildlife Service (USFWS). 2021a. National Wetlands Inventory. http://www.fws.gov/wetlands/Data/Mapper.html. (accessed November 2021).

_____. 2021b. Information, Planning and Conservation System (IPaC). https://ecos.fws.gov/ipac/. (accessed November 2021).

_____. 2021c. Critical Habitat Mapper. https://ecos.fws.gov/ecp/report/table/critical-habitat.html. (accessed November 2021).

Cultural Resources

ANR, University of California, Cooperative Extension San Joaquin County. 2021, *"Profile of San Joaquin County"*. https://ucanr.edu/sites/ce_san_joaquin/ files/35823.pdf, accessed August 17, 2021.

Bean, Walton, 1968, *California: An Interpretive History.* McGraw-Hill Book Company, New York.

Bean, Walton and James Rawls. 1983. *California: An Interpretive History. 10th Edition.* McGraw-Hill Book Company, New York.

Engelhardt, Zephyrin, O.F.M. 1927. *San Fernando Rey, the Mission of the Valley*. Franciscan Herald Press, Chicago.

Fredrickson, David A. 1973. *Early Cultural of the North Coast Ranges, California*. Ph.D. dissertation, University of California, Davis.

_____. 1994. Spatial and Cultural Units in Central California Archaeology. In *Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson*, assembled and edited by Richard E. Hughes.

Guinn, J. M. 1915. *A History of California and an Extended History of Los Angeles and Environs*, Vol.1. Historic Record Company, Los Angeles.

Gumprecht, Blake. 1999. *The Los Angeles River: Its Life, Death, and Possible Rebirth*. Johns Hopkins University Press, Baltimore.

Johnson, Stephen, Gerald Haslam, and Robert Dawson. 1993. *The Great Central Valley: California's Heartland*. University of California Press, Berkely.

Kyle, Douglas. 2002. *Historic Spots in California*. 5th ed. Revised by Douglas E. Kyle. Palo Alto, CA: Stanford University Press.

Lajeunesse, R. M. and J. M. Pryor. 1996. "SkyRocket Appendices." Report on file, department of Anthropology, California State University, Fresno.

McCawley, William. 1996. *The First Angelinos: The Gabrielino Indians of Los Angeles*. Malki Museum/Ballena Press Cooperative Publication, Banning or Novato, California.

McGuire, Kelly R. 1995. Test Excavations at CA-FRE-61, Fresno County, California. Occasional Papers in Anthropology No 5. Museum of Anthropology, California State University, Bakersfield.

Moratto, Michael J. 1984. *California Archaeology*. Coyote Press, Salinas, California.

Rolle, Andrew. 2003. *California: A History*. Revised and expanded sixth edition. Harlan Davidson, Inc., Wheeling, Illinois.

Rosenthal, Jeffrey, Gregory White, and Mark Sutton. 2007. The Central Valley: A View from the Catbird's Seat. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 147-164. AltaMira Press, Lanham Maryland.

San Joaquin County. 2017. *County Wide General Plan 2035 Policy Document Part 3, Goals and Policies, 3.4 Natural and Cultural Resources Element"*. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan%202035/Part%203.4a_Natural%20and%20Cultural%20Resources_2016-11-21.pdf, accessed August 19, 2021.

Tracy Historical Museum. 2021. "Tracy History," Tracy Historical Museum website, https://tracymuseum.org/tracy-history/, accessed September 1, 2021.

USGS. 2021. *"California's Central Valley"*. https://ca.water.usgs.gov/projects/central-valley/delta-eastside-streams.html, accessed August 17, 2021.

Visit Stockton. 2021. "A Historical Study of Stockton, California," Visit Stockton website. https://www.visitstockton.org/about-us/stockton-history/, accessed September 1, 2021.

Wallace, William. 1978. Post-Pleistocene Archaeology, 9000 to 2000 B.C. In California, edited by R. F. Heizer. Handbook of North American Indians, Vol. 8, W. C. Sturtevant, general editor, Smithsonian Institution, Washington D.C. pp. 25–36.

Workman, Boyle. 1935. *The City that Grew*. Southland Publication Co., Los Angeles.

Energy

California Air Resources Board [CARB]. 2020. California Refineries. https://ww2.arb.ca.gov/resources/documents/california-refineries (accessed March 2022).

California Energy Commission [CEC]. 2022a. 2016 Total System Electric Generation. https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2019-total-system-electric-generation/2016#:~:text=The%20Year%20in%20Review%20In%202016%2C%20total%20system,percent%20from%202015%E2%80%99s%20total%20generation%20of%20295%2C405%20GWh (accessed June 2022).

_____. 2022b. California Retail Fuel Outlet Annual Reporting (CEC-A15) Results. https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/california-retail-fuel-outlet-annual-reporting (accessed March 2022).

_____.2020a. Electricity Consumption by County. http://www.ecdms.energy.ca.gov/elecbycounty.aspx (accessed March 2022).

_____.2020b. Gas Consumption by County. http://www.ecdms.energy.ca.gov/gasbycounty.aspx (accessed March 2022).

California Department of Transportation (Caltrans). 1983. Energy and Transportation Systems. https://www.oregon.gov/ODOT/GeoEnvironmental/Docs_Environmental/Energy_Trans_Systems.pdf (accessed June 2022).

CalGEM. 2017. Well County and Production of Oil, Gas, and Water by County – 2016. https://www.conservation.ca.gov/calgem/pubs_stats/annual_reports/Pages/annual_reports.aspx (accessed March 2022).

Escalon, City of. 2019. City of Escalon General Plan. http://cityofescalon.org/government/departments/development_services/planning/general_plan (accessed March 2022).

Lathrop, City of. 1991. Comprehensive General Plan. https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/planning_division/page/5251/general_plan_11-9-04_-_entire_doc.pdf (accessed March 2022).

Lodi, City of. 2014. Climate Action Plan. https://www.lodi.gov/DocumentCenter/View/43/Climate-Action-Plan-PDF (accessed March 2022).

_____. 2010. Lodi General Plan. https://www.lodi.gov/DocumentCenter/View/199/Final-General-Plan---Entire-Document-PDF (accessed March 2022).

Manetca, City of. 2003. General Plan 2023. https://www.ci.manteca.ca.us/CommunityDevelopment/Documents/City%20of%20Manteca%20General%20Plan.pdf (accessed March 2022).

Pacific Gas & Electric (PG&E). 2020. Integrated Resource Plan. https://www.pge.com/pge_global/common/pdfs/for-our-business-partners/energy-supply/integrated-resource-planning/2020-PGE-Integrated-Resource-Plan.pdf (accessed March 2022).

Ripon, City of. 2006. General Plan. http://p1cdn4static.civiclive.com/UserFiles/Servers/Server_1080027/File/City%20Hall/City%20Government/Documents/Development/General%20Plan%202040%20Chapters.pdf (accessed March 2022).

San Joaquin Council of Governments [SJCOG]. 2022a. SJCOG Scenario Developer – Indicator Worksheet – 2046 (accessed June 2022).

_____. 2022b. San Joaquin County Charging Stations. https://www.sjcog.org/387/Alternative-Fuel#/find/nearest?location=san%20joaquin%20county (accessed March 2022).

_____. 2022c. SJCOG Scenario Builder v3.7.5 (accessed June 2022).

San Joaquin, County of. 2016. San Joaquin General Plan. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe?grp=planning&htm=gp2035 (accessed March 2022).

Stockton, City of. 2018. Envision Stockton 2040 General Plan. http://www.stocktonca.gov/files/Adopted_Plan.pdf (accessed March 2022).

Tracy, City of. 2011. City of Tracy General Plan. https://www.cityoftracy.org/home/showpublisheddocument/904/637451218786230000 (accessed March 2022).

U.S. Department of Energy [DOE]. 2022. Alternative Fueling Station Locator. https://afdc.energy.gov/stations/#/analyze?country=US&region=US-CA&fuel=BD (accessed March 2022).

U.S. Energy Information Administration [EIA]. 2021a. State Energy Data System (SEDS): 1960-2019 (complete). https://www.eia.gov/state/seds/seds-data-complete.php?sid=CA (accessed March 2022)

_____.2021b. Primary Energy Consumption Estimates, Selected Years, 1960-2019. https://www.eia.gov/energyexplained/us-energy-facts/ (accessed March 2022).

_____. 2021c. Table CT7. Transportation Sector Energy Consumption Estimates, 1960-2019, California. https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_use/tra/use_tra_CA.html&sid=CA (accessed March 2022).

_____. 2021d. Units and Calculators Explained. May 13, 2021. https://www.eia.gov/energyexplained/units-and-calculators/british-thermal-units.php (accessed May 2022).

_____. 2020. Total Energy Consumed Per Capita, 2019. https://www.eia.gov/state/rankings/?sid=CA#series/12 (accessed March 2022).

Agriculture and Forestry

California Department of Conservation (DOC). 2021. San Joaquin County Important Farmland Data Availability. https://www.conservation.ca.gov/dlrp/fmmp/Pages/SanJoaquin.aspx (accessed June 2022).

_____. 2019a. Alternate San Joaquin County 2016-2018 Land Use Conversion Table A-30. https://www.conservation.ca.gov/dlrp/fmmp/Documents/fmmp/pubs/2016-2018/alternate_conversion/Alternate_San_Joaquin_County_2016-2018_Land_Use_and_Rural_Conversion.pdf (accessed February 2022).

_____. 2019b. Important Farmland Categories. https://www.conservation.ca.gov/dlrp/fmmp/Pages/Important-Farmland-Categories.aspx (accessed June 2022).

_____. 2019c. Williamson Act Program. https://www.conservation.ca.gov/dlrp/wa/Pages/index.aspx (accessed June 2022).

_____. 2016. San Joaquin County. https://www.conservation.ca.gov/dlrp/fmmp/Pages/SanJoaquin.aspx. (accessed January 2022).

_____. 2016d Williamson Act Program. Williamson Act Status Report 2016-17 (ca.gov)

Escalon, City of. 2019. City of Escalon General Plan. http://cityofescalon.org/government/departments/development_services/planning/general_plan (accessed March 2022).

Lathrop, City of. Lathrop General Plan. 2004. https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/planning_division/page/5251/general_plan_11-9-04_-_entire_doc.pdf (accessed February 2022).

Lodi, City of. Lodi General Plan. 2010. https://www.lodi.gov/191/Plan-Documents (accessed February 2022).

Manteca, City of. Manteca General Plan. 2003. https://www.manteca.generalplan.org/content/documents (accessed February 2022).

Ripon, City of Ripon General Plan. 2006. http://p1cdn4static.civiclive.com/UserFiles/Servers/Server_1080027/File/City%20Hall/City20Government/Documents/Development/General%20Plan%202040%20Chapters.pdf (accessed February 2022).

San Joaquin, County of. 2020. San Joaquin Annual Crop Report, 2020. https://www.sjgov.org/department/agcomm/crop_reports/ (accessed November 2021).

_____. 2016. San Joaquin County General Plan. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan%202035/GENERAL%20PLAN%202035.pdf (accessed November 2021).

Stockton, City of. Stockton General Plan. 2018. http://www.stocktonca.gov/government/departments/communityDevelop/cdPlanGenDocs.html (accessed February 2022).

Tracy, City of. Tracy General Plan. 2011. https://www.cityoftracy.org/home/showpublisheddocument/374/637449291161070000 (accessed February 2022).

Environmental Justice

California Fair Housing Task Force (CFHTF). 2021. Methodology for the 2022 TCAC/HCD Opportunity Map. December 2021. https://www.treasurer.ca.gov/ctcac/opportunity/2022/2022-hcd-methodology.pdf (accessed May 2022).

_____. 2022. 2022 TCAC/HCD Opportunity Map. https://belonging.berkeley.edu/2022-tcac-opportunity-map (accessed May 2022).

Council on Environmental Quality (CEQ). 1997. Environmental Justice: Guidance Under the National Environmental Policy Act. December 10, 1997. https://www.epa.gov/sites/default/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf (accessed May 2022).

Employment Development Department. 2022. Monthly Labor Force Data for Counties January 2022 - Preliminary. https://labormarketinfo.edd.ca.gov/file/lfmonth/countyur-400c.pdf (accessed March 2022).

_____. 2020. Monthly Labor Force Data for Cities and Census Designated Places (CDP) Annual Average 2020 – Revised. https://labormarketinfo.edd.ca.gov/data/labor-force-and-unemployment-for-cities-and-census-areas.html (accessed May 2022).

San Joaquin Council of Governments (SJCOG). 2022a. Appendix P Environmental Justice Title VI Analysis. https://www.sjcog.org/DocumentCenter/View/7159/P-Environmental-Justice-Report (accessed June 2022).

_____. 2022b. SJCOG_ET_ScenarioBuildier_v3.7.5. March 24, 2022. (accessed June 2022).

Stockton, City of. 2018. Envision Stockton 2040 General Plan. December 4, 2018. http://www.stocktonca.gov/files/Adopted_Plan.pdf (accessed May 2022).

U.S. Census Bureau. 2022a. ACS Demographic and Housing Estimates. https://data.census.gov/cedsci/table?q=acs&g=0500000US06077&y=2020&d=ACS%205-Year%20Estimates%20Data%20Profiles&tid=ACSDP5Y2020.DP05 (accessed March 2022).

_____. 2022b. ACS Selected Economic Characteristics. https://data.census.gov/cedsci/table?q=san%20joaquin%20county&g=1600000US0603209,0616651,0622790,0628182,0640704,0642202,0645484,0661026,0675000,0680238&d=ACS%205-Year%20Estimates%20Data%20Profiles&tid=ACSDP5Y2020.DP03 (accessed June 2022).

_____. 2022c. Poverty Thresholds. https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html (accessed June 2022).

Geology and Soils

Bell, P.R. and D.C. Evans. 2010. Revision of the status of Saurolophus (Hadrosauridae) from California, USA. Canadian Journal of Earth Sciences, v. 47, 1417-1426.

California Geological Survey [CGS]. 2022. Earthquake Zones of Required Investigation. https://maps.conservation.ca.gov/cgs/EQZApp/app/ (accessed March 2022).

_____. 2002. California Geomorphic Provinces, Note 36. https://www.conservation.ca.gov/cgs/Documents/Publications/CGS-Notes/CGS-Note-36.pdf (accessed March 2022).

Camp, C.L. 1941. Ichthyosaur rostra from central California. Journal of Paleontology, v. 16, 362-371.

Dawson, T.E. 2009. Preliminary geologic map of the Lodi 30' x 60' quadrangle: California Geological Survey, Preliminary Geological Maps, scale 1:100,000.

Dibblee, T.W. and J.A. Minch. 2006a. Geologic map of the Midway & Tracy quadrangles, Alameda & San Joaquin Counties, California: Dibblee Geological Foundation, Dibblee Foundation Map DF-243, scale 1:24,000.

Dibblee, T.W. and J.A. Minch. 2006b. Geologic map of the Lone Tree quadrangle, Alameda, San Joaquin, and Stanislaus Counties, California: Dibblee Geological Foundation, Dibblee Foundation Map DF-242, scale 1:24,000.

Escalon, City of. 2019. City of Escalon General Plan. http://cityofescalon.org/government/departments/development_services/planning/general_plan (accessed March 2022).

Gutierrez, C.I. and P.J. Holland. 2018. Preliminary geologic map of the Valley Springs SW 7.5; quadrangle, Calaveras, San Joaquin, and Stanislaus Counties, California: California Geological Survey, Preliminary Geologic Maps, scale 1:24,000.

Jefferson, G.T. 2010. A catalogue of late Quaternary vertebrates from California. Natural History Museum of Los Angeles County Technical Report 7, p. 5-172.

Jennings, C.W., 2010, Geologic map of California: California Geological Survey, Geologic Data Map 2, scale 1:750,000.

Lathrop, City of. 1991. Comprehensive General Plan. https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/planning_division/page/5251/general_plan_11-9-04_-_entire_doc.pdf (accessed March 2022).

Lodi, City of. 2010. Lodi General Plan. https://www.lodi.gov/DocumentCenter/View/199/Final-General-Plan---Entire-Document-PDF (accessed March 2022).

Manetca, City of. 2003. General Plan 2023. https://www.ci.manteca.ca.us/CommunityDevelopment/Documents/City%20of%20Manteca%20General%20Plan.pdf (accessed March 2022).

Norris, R.M., and R.W. Webb. 1990. Geology of California. John Wiley and Sons, Inc. New York.

Paleobiology Database (PBDB). 2021. Fossil Locality Search. https://paleobiodb.org/#/ (accessed March 2022).

Ripon, City of. 2006. General Plan. http://p1cdn4static.civiclive.com/UserFiles/Servers/Server_1080027/File/City%20Hall/City%20Government/Documents/Development/General%20Plan%202040%20Chapters.pdf (accessed March 2022).

San Joaquin, County of. 2014. San Joaquin County 2035 General Plan Environmental Impact Report. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/Environmental%20Impact%20Reports/GENERAL%20PLAN%202035%20-%20DRAFT%20EIR.pdf (accessed March 2022).

Society of Vertebrate Paleontology. 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. Society of Vertebrate Paleontology Impact Mitigation Guidelines Revision Committee.

Stockton, City of. 2018. Envision Stockton 2040 General Plan. http://www.stocktonca.gov/files/Adopted_Plan.pdf (accessed March 2022).

Tracy, City of. 2011. City of Tracy General Plan. https://www.cityoftracy.org/home/showpublisheddocument/904/637451218786230000 (accessed March 2022).

University of California Museum of Paleontology (UCMP). 2021. UCMP online database specimen search portal, http://ucmpdb.berkeley.edu/.

Wahrhaftig, C., S.W. Stine, and N.K. Huber. 1993. Quaternary geologic map of the San Francisco Bay 4 degree x 6 degree quadrangle, United States: U.S. Geological Survey, Miscellaneous Investigations Series Map I-1420(NJ-10), scale 1:1,000,000.

GHG and Climate Change

Association of Environmental Professionals (AEP). 2016. Final White Paper Beyond 2020 and Newhall: A Field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California. https://califaep.org/docs/AEP-2016_Final_White_Paper.pdf (accessed May 2022).

California Air Resources Board (CARB). 2008. Climate Change Scoping Plan. Sacramento, CA. December 2008.

_____. 2014. AB 32 Scoping Plan Website. Updated June 2014. http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm (accessed May 2022).

_____. 2017. California's 2017 Climate Change Scoping Plan. December 14, 2017. https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf (accessed May 2022).

_____. 2019. Final Sustainable Communities Strategy Program and Evaluation Guidelines. November 2019. https://ww2.arb.ca.gov/resources/documents/scs-evaluation-resources (accessed May 2022).

_____. 2020a. EMFAC Off-Model Adjustment Factors for Carbon Dioxide (CO2) Emissions to Account for the SAFE Vehicles Rule Part One and the Final SAFE Rule. June 26, 2020. https://ww3.arb.ca.gov/msei/emfac_off_model_co2_adjustment_factors_06262020-final.pdf?utm_medium=email&utm_source=govdelivery (accessed May 2022).

_____.2020b. "SB 375 Regional Plan Climate Targets." https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets (accessed May 2022).

_____. 2021. "Current California Greenhouse Gas Emission Inventory – 2000-2019 GHG Inventory (2021 Edition). https://ww2.arb.ca.gov/ghg-inventory-data (accessed May 2022).

_____. 2022. AB 32 Scoping Plan Website. http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm (accessed May 2022).

California Climate Change Center (CCCC). 2006. Climate Scenarios for California.

California Department of Food and Agriculture. 2021. "California Agricultural Statistics Review." https://www.cdfa.ca.gov/Statistics/PDFs/2020_Ag_Stats_Review.pdf (accessed May 2022).

California Department of Transportation (Caltrans). 2021. California Transportation Plan 2050. https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/ctp-2050-v3-a11y.pdf (accessed May 2022).

California Department of Water Resources. 2018. Indicators of Climate Change in California. May 2018. https://oehha.ca.gov/media/downloads/climate-change/report/2018caindicatorsreportmay2018.pdf (accessed May 2022).

California Energy Commission. 2018. "2019 Building Energy Efficiency Standards." March 2018.

California State Transportation Agency (CalSTA). 2021. CAPTI: Climate Action Plan for Transportation Infrastructure. https://calsta.ca.gov/-/media/calsta-media/documents/capti-july-2021-a11y.pdf (accessed May 2022).

Forster, P., V. Ramaswamy, P. Artaxo, T. Berntsen, R. Betts, D.W. Fahey, J. Haywood, J. Lean, D.C. Lowe, G. Myhre, J. Nganga, R. Prinn, G. Raga, M. Schulz and R. Van Dorland. 2007. Changes in Atmospheric Constituents and in Radiative Forcing. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter2-1.pdf

Intergovernmental Panel on Climate Change (IPCC). 2014. Climate Change 2014 Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland.

_____. 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)] Cambridge University Press. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf (accessed May 2022).

Lodi, City of. 2014. City of Lodi Climate Action Plan. https://www.lodi.gov/DocumentCenter/View/43/Climate-Action-Plan-PDF#:~:text=Lodi%20Climate%20Action%20Plan,-To%20achieve%20these&text=The%20bill%20expands%20existing%20incentives,and%20lead%20in%20incandescent%20bulbs. (accessed June 2022).

Manteca, City of. 2013. City of Manteca Climate Action Plan. https://www.ci.manteca.ca.us/CommunityDevelopment/Planning%20Division/Planning%20Division%20Documents/General%20Plan/Climate%20Action%20Plan%20CAP%20Adopted%20Oct%2015%202013.pdf (accessed June 2022).

National Highway Traffic Safety Administration. 2022. March 31, 2022. NHTSA Finalizes CAFE Standards for MYs 2024-2026. https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy (accessed May 2022).

Parmesan, C. August 2006. Ecological and Evolutionary Responses to Recent Climate Change.

Southern California Association of Governments (SCAG). 2020. Certified Final Program Environmental Impact Report for the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments (SCH#20199011061). Certified May 2020. https://scag.ca.gov/program-environmental-impact-report (accessed May 2022).

State of California. 2018. California's Fourth Climate Change Assessment Statewide Summary Report. August 27, 2018. https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf (accessed May 2022).

Stockton, City of. 2014. Climate Action Plan. https://www.stocktonca.gov/files/Climate_Action_Plan_August_2014.pdf (accessed June 2022).

Tracy, City of. 2011. City of Tracy Sustainability Action Plan. https://www.cityoftracy.org/home/showpublisheddocument/2950/637514921184370000 (accessed June 2022).

United States Environmental Protection Agency (U.S. EPA). 2021a. Climate Change Indicators: Atmospheric Concentrations of Greenhouse Gases. Last updated April 2021. https://www.epa.gov/climate-indicators/climate-change-indicators-atmospheric-concentrations-greenhouse-gases (accessed May 2022).

_____. 2021b. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019. April 2021. https://www.epa.gov/system/files/documents/2022-02/us-ghg-inventory-2022-main-text.pdf (accessed May 2022).

World Meteorological Organization. 2020. "Greenhouse Gases." https://public.wmo.int/en/our-mandate/focus-areas/environment/greenhouse%20gases (accessed May 2022).

Hazards and Hazardous Materials

California Department of Toxic Substances Control (DTSC). 2021. Active Transporter County Search Results. Available at https://hwts.dtsc.ca.gov/transporters/TRANSRCH04.cfm (Accessed Dec. 2021)

California Department of Education (CADOE) 2021. School directory online search tool. Available at https://www.cde.ca.gov/SchoolDirectory/ (Accessed December 2021).

San Joaquin County Office of Education. 2021. Informational website. Available at https://www.sjcoe.org/about/ (Accessed December 2021).

Transportation Research Board (TRB) 2004 *Transmission Pipelines and Land Use: A Risk-Informed Approach*. Available at https://trb.org/publications/sr/sr281.pdf (Accessed December 2021).

United States Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA) 2020. Hazardous Materials Transportation Incidents Data. Available at https://portal.phmsa.dot.gov/analytics/ (Accessed Dec 2020)

_____, National Pipeline Mapping System 2021. Online mapping tool. Available at https://pvnpms.phmsa.dot.gov/PublicViewer/ (accessed December 2021)

_____, Bureau of Transportation Statistics. 2021. Transportation Statistics Annual Report 2020

Lodi, City of. 2010. https://www.lodi.gov/191/Plan-Documents (accessed June 2022)

Manteca, City of. Manteca General Plan. 2003. https://www.manteca.generalplan.org/content/documents (accessed June 2022).

Tracy. City of. Tracy General Plan. 2011. https://www.cityoftracy.org/home/showpublisheddocument/374/637449291161070000 (accessed February 2022).

USGS. 2011. *Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California.* https://pubs.usgs.gov/of/2011/1188/ (accessed June 2022).

Hydrology and Water Quality

California Department of Conservation, California Geological Survey (CGS). 2002. California's Geomorphic Provinces. Available at https://www.coastal.ca.gov/coastalvoices/resources/California_Geomorphic_Provinces.pdf (accessed November 2021).

California Department of Water Resources (DWR). 2006a. Bulletin 118, California's Groundwater—Eastern San Joaquin Subbasin.

_____. 2006b Bulletin 118, California's Groundwater—Tracy Subbasin

_____. 2006c Bulletin 118, California's Groundwater—Cosumnes Subbasin

_____. 2021. SGMA Data Viewer online mapping tool. Available at https://water.ca.gov/Programs/Groundwater-Management/Data-and-Tools (accessed November 2021)

_____. 2022. Division of Safety of Dams Inundation Maps online mapping tool. Available at https://water.ca.gov/Programs/All-Programs/Division-of-Safety-of-Dams/Inundation-Maps (accessed January 2022).

Central Valley Flood Protection Board. 2021. Best Available Maps Flood Zone and Floodway mapping tool. Available at https://gis.bam.water.ca.gov/bam/ (accessed November 2021).

Central Valley Regional Water Quality Control Board (CVRWQCB) 2018 The Water Quality Control Plan for the Central Valley Region—The Sacramento River Basin and the San Joaquin River Basin.

Eastern San Joaquin Groundwater Authority (ESJGA) 2019. Eastern San Joaquin Groundwater Subbasin Groundwater Sustainability Plan.

Eastern San Joaquin Groundwater Basin authority (ESJGBA). 2014. Eastern San Joaquin Integrated Regional Water Management Plan.

Greater San Joaquin County Regional Water Coordinating Committee (RWCC) 2020. 2014 IRWMP Addendum.

National Aeronautics and Space Agency (NASA). 2015. Federal Agencies Release Data Showing California Central Valley Idle Farmland Doubling During Drought. Available at https://landsat.gsfc.nasa.gov/article/federal-agencies-release-data-showing-california-central-valley-idle-farmland-doubling-during-drought/

San Joaquin Area Flood Control Agency (SJAFCA). 2021. Agency website introduction. Available at https://www.sjafca.org/about-sjafca (accessed December 2021)

San Joaquin, County of (2016) General Plan, Natural and Cultural Resources Element (The Delta). Available at https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan%202035/Part%203.4b_The%20Delta_2016-11-21.pdf (accessed November 2021).

San Joaquin County Office of Emergency Services (SJCOES). 2021. Flood and Dam Failure Annex.

Tracy Subbasin Groundwater Sustainability Agencies (TSGSA) 2021 Draft Final Tracy Subbasin Groundwater Sustainability Plan.

Land Use and Planning

County of San Joaquin. County of San Joaquin 2035 General Plan. November 2017. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe?grp=planning&htm=gp2035 (accessed 15 January 2022).

Escalon, City of. 2005. General Plan. https://escalon.hosted.civiclive.com/government/departments/development_services/planning/general_plan (accessed 15 January 2022).

Lathrop, City of. General Plan. November 2004. https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/planning_division/page/5251/general_plan_11-9-04_-_entire_doc.pdf (accessed 13 January 2022).

Lodi, City of. April 2010. https://www.lodi.gov/191/Plan-Documents (accessed 13 January 2022).

Manteca, City of. General Plan 2023. May 19, 2016. https://www.sjafca.org/home/showpublisheddocument/1205 (accessed 13 January 2022).

Ripon, City of. General Plan 2040. September 19, 2006. https://cdn5-hosted.civiclive.com/UserFiles/Servers/Server_1080027/File/City%20Hall/City%20Government/Documents/Development/General%20Plan%202040%20Chapters.pdf (accessed 13 January 2022).

Stockton, City of. Envision Stockton General Plan 2040. December 4, 2018. http://www.stocktonca.gov/government/departments/communityDevelop/cdPlanGenDocs.html (accessed 14 January 2022).

Tracy, City of. 2011 Tracy General Plan. February 1, 2011. https://www.cityoftracy.org/home/showpublisheddocument/374/637449291161070000 (accessed 18 January 2022).

Noise

California Department of Transportation (Caltrans). 2011. California Airport Land Use Planning Handbook. https://dot.ca.gov/-/media/dot-media/programs/aeronautics/documents/californiaairportlanduseplanninghandbook-a11y.pdf (accessed February 2022).

____. 2020. Transportation and Construction Vibration Guidance Manual. April 2020. https://dot.ca.gov/programs/environmental-analysis/noise-vibration/guidance-manuals (accessed February 2022).

____. 2017. Traffic Census Program. https://dot.ca.gov/programs/traffic-operations/census (accessed February 2022).

San Joaquin County Council of Governments. 2018a. San Joaquin County's Aviation System; Stockton Municipal Airport. Adopted May 2016, Amended February 2018. https://www.sjcog.org/DocumentCenter/View/1318/2016-Stockton-Metropolitan-Airport-ALUCP---Amended-February-2018?bidId= (accessed April 2022).

____. 2018b. San Joaquin County's Aviation System; Airport Land Use Compatibility Plan. Adopted June 2009, Amended January 2018. https://www.sjcog.org/DocumentCenter/View/17/2009-San-Joaquin-County-ALUCP---Amended-January-2018?bidId= (accessed April 2022)

San Joaquin, County of. 2016. General Plan 2035 Update. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan%202035/GENERAL%20PLAN%202035.pdf (accessed February 2022).

Federal Highway Administration (FHWA). 2018. *Techniques for Reviewing Noise Analyses and Associated Noise Reports.* June 2018. https://www.fhwa.dot.gov/Environment/noise/resources/reviewing_noise_analysis/fhwahep18067.pdf (accessed February 2022).

Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf (accessed February 2022).

Transportation

California Department of Transportation (Caltrans). 2014. California Manual on Uniform Traffic Control Devices. Revision 6. March 30, 2021. https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/ca-mutcd/rev6/camutcd2014-rev6.pdf (accessed May 2022).

_____. 2020a. Transportation Analysis under CEQA. Evaluating Transportation Impacts of State Highway System Projects. https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/sb-743/2020-09-10-1st-edition-tac-fnl-a11y.pdf (accessed May 2022).

_____. 2020b. Transportation Analysis Framework. Evaluating Transportation Impacts of State Highway System Projects. https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/sb-743/2020-09-10-1st-edition-taf-fnl-a11y.pdf (accessed May 2022).

_____. 2021. California Transportation Plan 2050. https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/ctp-2050-v3-a11y.pdf (accessed May 2022).

California Governor's Office of Planning and Research (Cal OPR). 2018. SB 743 Technical Advisory. https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf (accessed May 2022).

California State Transportation Agency (CalSTA). 2021. CAPTI: Climate Action Plan for Transportation Infrastructure. https://calsta.ca.gov/-/media/calsta-media/documents/capti-july-2021-a11y.pdf (accessed May 2022).

California Transportation Commission (CTC). 2017a. 2017 Regional Transportation Plan Guidelines for Metropolitan Planning Organizations. https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/f0009312-2017rtpguidelinesformpos-a11y.pdf (accessed May 2022).

_____. 2017b. 2017 Regional Transportation Plan Guidelines for Regional Transportation Planning Agencies. https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/2017rtpguidelinesforrtpas-a11y.pdf (accessed May 2022).

Escalon, City of. 2010. City of Escalon General Plan. Circulation Element. https://cdn5-hosted.civiclive.com/UserFiles/Servers/Server_10745808/File/Government/Departments/Development%20Services/Planning/General_Plan_Amended_12-2-19.pdf (Accessed June 2022).

Federal Highway Administration (FHWA). 2002. Highway Economic Requirements System – State Version (HERS-ST). Pilot Program Report. http://libraryarchives.metro.net/DPGTL/usdot/2002-hers-st-highway-economic-requirements-system-state-version-pilot-program-report.pdf (accessed June 2022)

_____. 2012. Integrating Demand Management into the Transportation Planning Process: A Desk Reference. Publication Number FHWA-HOP-12-035. https://ops.fhwa.dot.gov/publications/fhwahop12035/index.htm. (accessed June 2022).

Lathrop, City of. 2022. City of Lathrop General Plan Update Public Draft. Circulation Element. https://static1.squarespace.com/static/5a26dc6564b05f670d0bf079/t/628ff03a9e47d06795ee11ea/1653600331983/Public+Draft+LathropGP.pdf (accessed June 2022).

Lodi, City of. 2010. City of Lodi General Plan. Chapter 5 – Transportation. https://www.lodi.gov/DocumentCenter/View/193/Chapter-5---Transportation-PDF (accessed June 2022).

Manteca, City of. 2021. City of Manteca General Plan Update Public Draft. Circulation. https://static1.squarespace.com/static/582f3c2a59cc689c8da65127/t/60a3f8c125c8aa6d5b312242/1621358788165/4_Circulation_Print.pdf (accessed June 2022).

National Association of Counties (NaCo). 2021. Legislative Analysis of the Bipartisan Infrastructure Law. https://www.naco.org/resources/legislative-analysis-counties-bipartisan-infrastructure-law (accessed June 2022).

Ripon, City of. 2006. City of Ripon General Plan. Circulation and Transportation. https://cdn5-hosted.civiclive.com/UserFiles/Servers/Server_1080027/File/City%20Hall/City%20Government/Documents/Development/General%20Plan%202040%20Chapters.pdf (accessed June 2022),

San Joaquin Council of Governments (SJCOG). 2018. 2018 Regional Transportation Plan/Sustainable Communities Strategy. https://www.sjcog.org/278/Adopted-2018-RTPSCS (accessed June 2022).

_____. 2012. Regional Bicycle, Pedestrian, and Safe Routes to School Master Plan. https://www.sjcog.org/DocumentCenter/View/61/Regional-Bicycle-Pedestrian-and-Safe-Routes-to-School-Master-Plan (accessed May 2022).

_____. n.d.a. Regional Transportation Impact Fee. https://www.sjcog.org/118/Regional-Transportation-Impact-Fee-RTIF (accessed June 2022).

_____. n.d.b. Regional Congestion Management Plan (Program R). https://www.sjcog.org/398/Regional-Congestion-Management-Program-R (accessed June 2022).

San Joaquin, County of. 2016. San Joaquin County General Plan 2035. Public Facilities and Services Element. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan% 202035/GENERAL%20PLAN%202035.pdf (accessed June 2022).

Stockton, City of. 2018. Envision Stockton 2040. Transportation. http://www.stocktonca.gov/files/Adopted_Plan.pdf (accessed June 2022).

Tracy, City of. 2011. City of Tracy General Plan. Circulation Element. https://www.cityoftracy.org/home/showpublisheddocument/374/637449291161070000 (accessed June 2022).

U.S. Department of Transportation. 2022. The Bipartisan Infrastructure Law Will Deliver for California. https://www.transportation.gov/sites/dot.gov/files/2022-01/BIL_California.pdf (accessed May 2022).

Tribal Cultural Resources

Kroeber, Alfred J. 1925. Handbook of the Indians of California. Bureau of Ethnology Bulletin, Volume 78, pp. 1-995.

Levy, Richard B. 1977. " Eastern Miwok." In *Handbook of North American Indians*, edited by Robert E Heizer, pp. 389-413.

Mithun, Marianne. *The Languages of Native North America*. Cambridge: Cambridge University Press, 2001.

Sutton, Mark Q., Jill Gardner, Kenneth Gobalet, and Nancy Valente. "Archaeological Investigations at the Manifold Site (CA-KER-4220), Buena Vista Lake, Southern San Joaquin Valley, California." *Pacific Coast Archaeological Society Quarterly 52, no. 4 (*2016): 15-82.

USGS. 2021. *California's Central Valley*. https://ca.water.usgs.gov/projects/central-valley/delta-eastside-streams.html (accessed August 17 2021).

Wallace, William J. "Southern Valley Yokuts." In *Handbook of North American Indians, Vol. 8*, edited by R.F. Heizer, 448-470. Washington D.C.: Smithsonian Institution, 1978.

Wildfire

California Department of Forestry and Fire Protection (CAL FIRE). 2008. Fire Hazard Severity Zone (FHSZ) Maps – San Joaquin. https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/ (accessed March 2022)

_____.2007. Fire Hazard Severity Zone Viewer. https://egis.fire.ca.gov/FHSZ/ (accessed March 2022).

_____.2021. San Joaquin County - Draft Fire Hazard Severity Zones in LRA. https://osfm.fire.ca.gov/media/6794/fhszl06_1_map39.pdf (accessed March 2022)

_____.2022. Top 20 Largest California Wildfires. January 13, 2022. https://www.fire.ca.gov/media/4jandlhh/top20_acres.pdf (accessed March 2022).

California Governor's Office of Emergency Services (Cal OES). 2017. State of California Emergency Plan. https://www.caloes.ca.gov/PlanningPreparednessSite/Documents/California_State_Emergency_Plan_2017.pdf (accessed March 2022).

_____.2018. State of California Hazard Mitigation Plan. https://www.caloes.ca.gov/HazardMitigationSite/Documents/002-2018%20SHMP_FINAL_ENTIRE%20PLAN.pdf (accessed March 2022).

Lathrop, City of. 1991. City of Lathrop General Plan. https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/planning_division/page/5251/general_plan_11-9-04_-_entire_doc.pdf (accessed March 2022).

San Joaquin, County of. 2016. San Joaquin General Plan. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan%202035/GENERAL%20PLAN%202035.pdf (access March 2022).

Tracy, City of. 2011. City of Tracy General Plan. https://www.cityoftracy.org/home/showpublisheddocument/374/637449291161070000 (accessed March 2022).

Ripon, City of. 2006. City of Ripon General Plan. http://p1cdn4static.civiclive.com/UserFiles/Servers/Server_1080027/File/City%20Hall/City%20Government/Documents/Development/General%20Plan%202040%20Chapters.pdf (accessed March 2022).

Effects Considered Less Than Significant

California Department of Housing and Community Development (HCD). 2022. California Green Building Standards Code. https://www.hcd.ca.gov/calgreen (accessed June 2022).

San Joaquin County, of. 2022. Department of Public Works. https://www.sjgov.org/department/pwk/solid-waste/san-joaquin-county-solid-waste-facilities/foothill-sanitary-landfill. (accessed June 2022).

San Joaquin**,** County of. 2016. San Joaquin County 2035 General Plan Update. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan%202035/GENERAL%20PLAN%202035.pdf (accessed June 2022).

San Joaquin, County of. 2014. San Joaquin County 2035 General Plan Draft Environmental Impact Report. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/Environmental%20Impact%20Reports/GENERAL%20PLAN%202035%20-%20DRAFT%20EIR.pdf (accessed June 2022).

Other CEQA Related Discussions

University of the Pacific Center for Business & Policy Research (UOP). 2020. *San Joaquin County Demographic and Employment Forecast.* (accessed June 2022).

7.2 List of Preparers

This EIR was prepared by the San Joaquin Council of Governments, with the assistance of Rincon Consultants, Inc. Consultant staff involved in the preparation of the EIR are listed below.

RINCON CONSULTANTS, INC.

Megan Jones, Principal
Eric VonBerg, Senior Project Manager
Nik Kilpelainen,
Beth Wilson, Biologist
Victoria Chung, Environmental Planner
Eric Moland, Environmental Planner
Jake Nyiri

Appendix A

Air Quality and Greenhouse Gas Emissions Modeling

SJCOG 2022 RTP/SCS Air Quality Emission Calculations

Scenario	VMT*	ROG (tons/day)	NO_X (tons/day)	PM_{10} (tons/day)[1]	$PM_{2.5}$ (tons/day)[1]	Fugitive PM_{10} (tons/day)[2]	Fugitive $PM_{2.5}$ (tons/day)[2]	CO (tons/day)	SOx (tons/day)	CO2e (tons/day)	CO2e (metric tons/year)
2016 SJCOG Baseline											
On-Road Motor Vehicles	17,015,116.00	5.847	17.264	0.824	0.458	0.512	0.161	54.613	0.092	9,231	3,056,728
2046 No Build											
On-Road Motor Vehicles	23,220,752.00	2.044	4.716	0.752	0.276	0.687	0.214	19.292	0.081	8,190	2,712,035
2046 Scenario B											
On-Road Motor Vehicles	23,397,883.00	2.060	4.752	0.758	0.278	0.693	0.216	19.439	0.081	8,253	2,732,723
2046 Project (Scenario E)											
On-Road Motor Vehicles	23,495,442.00	2.069	4.772	0.761	0.279	0.696	0.217	19.520	0.082	8,287	2,744,117
Difference (2046 Project - Baseline)	**6,480,326.00**	**-3.778**	**-12.493**	**-0.062**	**-0.178**	**0.184**	**0.056**	**-35.093**	**-0.010**	-944.09	-312,610.69
%	**38%**	**-65%**	**-72%**	**-7.6%**	**-39.0%**	**36%**	**35%**	**-64%**	**-11%**	-10%	-10%
Difference (2046 Project - No Build)	274,690.00	0.02	0.06	0.01	0.00	0.01	0.00	0.23	0.00	96.89	32,082.03
%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Difference (2046 Project - ScenB)	97,559.00	-2.71	-5.48	-0.83	-0.67	-0.33	0.13	-20.08	-0.19	-8,253.01	-2,732,723.10
%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Notes

*** VMT from SJCOG "Transportation Model Metrics" Spreadsheet. Not adjusted for induced demand.**

Annual emissions - Total

1) Includes tire and break wear in the total PM

2) Includes only tire and break wear

Scenario	Diesel PM2.5 (tons/day)	Diesel PM10 (tons/day)1	Diesel NOX (tons/day)	Diesel SOX (tons/day)	Diesel CO (tons/day)
2016 SJCOG Baseline					
On-Road Motor Vehicles	0.261	0.27	11.98	0.02	2.26
2046 No Build					
On-Road Motor Vehicles	0.049	0.05	3.73	0.03	1.37
2046 Scenario B					
On-Road Motor Vehicles	0.049	0.05	3.76	0.03	1.38
2046 Project (Scenario E)					
On-Road Motor Vehicles	0.049	0.05	3.78	0.03	1.38
Difference (2046 Project - Baseline)	**-0.212**	**-0.222**	**-8.206**	**0.001**	**-0.873**
%	**-81%**	**-81%**	**-68%**	**3%**	**-39%**
Difference (2046 Project - No Build)	0.001	0.001	0.044	0.000	0.016
Difference (2046 Project - ScenB)	0.000	0.000	0.016	0.000	0.006

Notes

Diesel annual emissions -Total Exhaust (TOTEX)

Group	Area	GAI	Sub-Area	Cal. Year	Season	Title	Veh_Tech	EMFAC2011 Category	Population	Total_VMT	cVMT	eVMT	Trips	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_TOTEX	TOG_DIURN	TOG_HTSK	TOG_RUNLS	TOG_TOTAL	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_TOTEX	ROG_DIURN	ROG_HTSK	ROG_RUNLS
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	All Vehicles	All Vehicles	435,230.8	17,015,116.0	16,960,199.3	54,916.7	2,276,638.8	2.01	0.0778	1.91	3.99	1.12	0.4357	0.9683	6.51	1.52	0.0624	1.74	3.33	1.12	0.4357	0.9683
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	All Other Buses-Dsl	All Other Buses - Dsl	65.3	2,971.9	2,971.9	0	581.4	0.0055	0.0001		0.0055				0.0055	0.0048	0.0001		0.0049			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDA-Dsl	LDA - Dsl	1,087.1	43,402.5	43,402.5	0	4,957.3	0.0021			0.0021				0.0021	0.0018			0.0018			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDA-Elec	LDA - Oth	648.1	22,688.5	0	22,688.5	3,296.8				0				0				0			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDA-Gas	LDA - Gas	213,536.4	8,669,883.8	8,669,883.8	0	989,114.7	0.4879		0.7965	1.28	0.5103	0.1666	0.4058	2.37	0.3412		0.7276	1.07	0.5103	0.1666	0.4058
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDA-Phe	LDA - Gas	1,244.4	67,036.7	36,325.3	30,711.4	5,145.8	0.0002		0.0011	0.0013	0.0009	0.0002	0.0002	0.0025	0.0001		0.0010	0.0011	0.0009	0.0002	0.0002
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDT1-Dsl	LDT1 - Dsl	35.8	690.1	690.1	0	127.6	0.0002			0.0002				0.0002	0.0002			0.0002			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDT1-Elec	LDT1 - Oth	7.39	183.6	0	183.6	33.6				0				0				0			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDT1-Gas	LDT1 - Gas	22,506.7	758,899.2	758,899.2	0	98,438.2	0.1184		0.1391	0.2574	0.1166	0.0360	0.1027	0.5126	0.0849		0.1271	0.2120	0.1166	0.0360	0.1027
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDT2-Dsl	LDT2 - Dsl	125.8	5,805.2	5,805.2	0	598.3	0.0003			0.0003				0.0003	0.0002			0.0002			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDT2-Elec	LDT2 - Oth	7.36	186.8	0	186.8	33.7				0				0				0			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDT2-Gas	LDT2 - Gas	70,367.1	2,651,085.5	2,651,085.5	0	321,665.8	0.2274		0.3466	0.5740	0.1806	0.0598	0.1447	0.9591	0.1625		0.3167	0.4791	0.1806	0.0598	0.1447
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDT2-Phe	LDT2 - Gas	6.73	381.8	206.9	174.9	27.8	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LHD1-Dsl	LHD1 - Dsl	8,282.0	313,153.5	313,153.5	0	104,177.3	0.1176	0.0011		0.1187				0.1187	0.1033	0.0010		0.1043			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LHD1-Gas	LHD1 - Gas	8,099.9	265,236.7	265,236.7	0	120,676.7	0.0624	0.0062	0.0383	0.1070	0.0339	0.0113	0.0506	0.2029	0.0452	0.0043	0.0351	0.0845	0.0339	0.0113	0.0506
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LHD2-Dsl	LHD2 - Dsl	2,351.0	93,437.0	93,437.0	0	29,572.6	0.0297	0.0003		0.0301				0.0301	0.0261	0.0003		0.0264			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LHD2-Gas	LHD2 - Gas	978.0	33,328.4	33,328.4	0	14,570.2	0.0056	0.0008	0.0040	0.0103	0.0037	0.0011	0.0055	0.0206	0.0038	0.0005	0.0037	0.0080	0.0037	0.0011	0.0055
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	MCY-Gas	MCY - Gas	11,590.2	69,729.4	69,729.4	0	23,180.4	0.1623		0.0530	0.2153	0.0658	0.0920	0.0953	0.4684	0.1404		0.0488	0.1892	0.0658	0.0920	0.0953
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	MDV-Dsl	MDV - Dsl	867.2	40,555.9	40,555.9	0	4,250.6	0.0010			0.0010				0.0010	0.0009			0.0009			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	MDV-Elec	MDV - Oth	0.9166	19.8	0	19.8	4.02				0				0				0			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	MDV-Gas	MDV - Gas	76,648.8	2,644,188.6	2,644,188.6	0	347,384.5	0.2813		0.5132	0.7945	0.1865	0.0626	0.1517	1.20	0.1992		0.4688	0.6880	0.1865	0.0626	0.1517
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	MDV-Phe	MDV - Gas	32.1	1,795.2	972.8	822.4	132.7	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	MH-Dsl	MH - Dsl	556.6	5,378.7	5,378.7	0	55.7	0.0010			0.0010				0.0010	0.0009			0.0009			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	MH-Gas	MH - Gas	1,839.6	15,449.5	15,449.5	0	184.0	0.0042		0.0001	0.0042	0.0119	0.0037	0.0001	0.0200	0.0030		0.0000	0.0030	0.0119	0.0037	0.0001
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	Motor Coach-Dsl	Motor Coach - Dsl	17.6	2,185.0	2,185.0	0	403.7	0.0010	0.0002		0.0012				0.0012	0.0009	0.0002		0.0011			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	OBUS-Gas	OBUS - Gas	191.5	10,326.2	10,326.2	0	3,831.3	0.0031	0.0002	0.0013	0.0045	0.0006	0.0002	0.0007	0.0060	0.0021	0.0002	0.0011	0.0034	0.0006	0.0002	0.0007
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	PTO-Dsl	PTO-Dsl	0	16,886.4	16,886.4	0		0.0137			0.0137				0.0137	0.0121			0.0121			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	PTO-Elec	PTO-Oth	0	0							0				0				0			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	SBUS-Dsl	SBUS - Dsl	500.3	10,546.5	10,546.5	0	7,244.0	0.0013	0.0001		0.0014				0.0014	0.0011	0.0001		0.0012			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	SBUS-Gas	SBUS - Gas	37.2	2,036.6	2,036.6	0	148.8	0.0028	0.0006	0.0002	0.0036	0.0002	0.0001	0.0002	0.0041	0.0022	0.0004	0.0002	0.0028	0.0002	0.0001	0.0002
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	SBUS-NG	SBUS-Oth	53.6	1,245.9	1,245.9	0	776.6	0.0053	0.0010		0.0063				0.0063	0.0001	0.0000		0.0001			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 CAIRP Class 4-Dsl	T6 CAIRP small-Dsl	7.61	577.8	577.8	0	174.9	0.0001	0.0000		0.0001				0.0001	0.0001	0.0000		0.0001			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 CAIRP Class 5-Dsl	T6 CAIRP small-Dsl	9.86	792.6	792.6	0	226.7	0.0001	0.0000		0.0001				0.0001	0.0001	0.0000		0.0001			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 CAIRP Class 6-Dsl	T6 CAIRP small-Dsl	25.5	2,071.0	2,071.0	0	586.0	0.0004	0.0000		0.0004				0.0004	0.0003	0.0000		0.0003			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 CAIRP Class 7-Dsl	T6 CAIRP heavy-Dsl	83.2	12,990.6	12,990.6	0	1,912.1	0.0022	0.0000		0.0022				0.0022	0.0019	0.0000		0.0019			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Delivery Class 4-Dsl	T6 instate small-Dsl	269.7	6,981.6	6,981.6	0	3,849.1	0.0053	0.0003		0.0056				0.0056	0.0046	0.0003		0.0049			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Delivery Class 5-Dsl	T6 instate small-Dsl	197.1	4,541.2	4,541.2	0	2,812.4	0.0034	0.0002		0.0037	0.0030	0.0002		0.0037	0.0030	0.0002		0.0032			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Delivery Class 6-Dsl	T6 instate small-Dsl	667.1	19,707.7	19,707.7	0	9,519.4	0.0149	0.0008		0.0157	0.0131	0.0007		0.0157	0.0131	0.0007		0.0138			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Delivery Class 7-Dsl	T6 instate heavy-Dsl	293.7	5,919.5	5,919.5	0	4,191.2	0.0045	0.0004		0.0049				0.0049	0.0039	0.0004		0.0043			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Delivery Class 7-NG	T6 instate heavy-NG	0.0172	0.3671	0.3671	0	0.2450	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Other Class 4-Dsl	T6 instate small-Dsl	539.1	15,516.3	15,516.3	0	6,232.3	0.0084	0.0007		0.0091				0.0091	0.0074	0.0006		0.0080			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Other Class 5-Dsl	T6 instate small-Dsl	858.5	43,807.8	43,807.8	0	9,923.7	0.0236	0.0011		0.0247				0.0247	0.0207	0.0010		0.0217			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Other Class 6-Dsl	T6 instate small-Dsl	850.8	32,537.7	32,537.7	0	9,835.2	0.0179	0.0012		0.0190				0.0190	0.0157	0.0010		0.0167			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Other Class 7-Dsl	T6 instate heavy-Dsl	946.1	22,176.4	22,176.4	0	10,936.5	0.0105	0.0014		0.0119	0.0092	0.0013		0.0119	0.0092	0.0013		0.0105			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Other Class 7-NG	T6 instate heavy-NG	0.0538	2.20	2.20	0	0.6218	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Tractor Class 6-Dsl	T6 instate small-Dsl	9.68	430.8	430.8	0	111.9	0.0002	0.0000		0.0002	0.0002	0.0000		0.0002	0.0002	0.0000		0.0002			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Tractor Class 7-Dsl	T6 instate heavy-Dsl	518.6	37,176.3	37,176.3	0	5,995.5	0.0198	0.0008		0.0206	0.0174	0.0007		0.0206	0.0174	0.0007		0.0181			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Tractor Class 7-NG	T6 instate heavy-NG	0.0287	3.24	3.24	0	0.3313	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 OOS Class 4-Dsl	T6 OOS small-Dsl	4.36	330.8	330.8	0	100.3	0.0001	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 OOS Class 5-Dsl	T6 OOS small-Dsl	5.66	453.8	453.8	0	130.1	0.0001	0.0000		0.0001				0.0001	0.0001	0.0000		0.0001			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 OOS Class 6-Dsl	T6 OOS small-Dsl	14.6	1,185.8	1,185.8	0	336.2	0.0002	0.0000		0.0002				0.0002	0.0002	0.0000		0.0002			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 OOS Class 7-Dsl	T6 OOS heavy-Dsl	47.7	8,622.0	8,622.0	0	1,096.3	0.0016	0.0000		0.0016				0.0016	0.0014	0.0000		0.0014			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Public Class 4-Dsl	T6 Public-Dsl	49.0	924.8	924.8	0	251.6	0.0001	0.0000		0.0001				0.0001	0.0001	0.0000		0.0001			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Public Class 4-NG	T6 Public-NG	0.4780	11.1	11.1	0	2.45	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Public Class 5-Dsl	T6 Public-Dsl	66.6	2,551.6	2,551.6	0	341.8	0.0002	0.0000		0.0003				0.0003	0.0002	0.0000		0.0002			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Public Class 5-NG	T6 Public-NG	1.66	70.8	70.8	0	8.53	0.0001	0.0000		0.0001				0.0001	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Public Class 6-Dsl	T6 Public-Dsl	70.0	3,948.8	3,948.8	0	359.1	0.0007	0.0001		0.0007				0.0007	0.0006	0.0000		0.0006			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Public Class 6-NG	T6 Public-NG	0.7505	54.6	54.6	0	3.85	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Public Class 7-Dsl	T6 Public-Dsl	167.7	6,139.7	6,139.7	0	860.5	0.0012	0.0002		0.0014				0.0014	0.0011	0.0001		0.0012			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Public Class 7-NG	T6 Public-NG	1.74	100.7	100.7	0	8.92	0.0001	0.0000		0.0001				0.0001	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Utility Class 5-Dsl	T6 Utility-Dsl	39.5	1,154.8	1,154.8	0	505.7	0.0001	0.0000		0.0001				0.0001	0.0001	0.0000		0.0001			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Utility Class 5-NG	T6 Utility-NG	0.0795	2.37	2.37	0	1.02	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Utility Class 6-Dsl	T6 Utility-Dsl	10.3	218.1	218.1	0	131.4	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Utility Class 6-NG	T6 Utility-NG	0.0280	0.6262	0.6262	0	0.3578	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Utility Class 7-Dsl	T6 Utility-Dsl	16.9	303.3	303.3	0	216.4	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Utility Class 7-NG	T6 Utility-NG	0.0481	0.9266	0.9266	0	0.6161	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6TS-Gas	T6TS - Gas	608.8	24,362.0	24,362.0	0	12,180.7	0.0204	0.0009	0.0141	0.0355	0.0049	0.0020	0.0108	0.0531	0.0154	0.0007	0.0130	0.0291	0.0049	0.0020	0.0108
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 CAIRP Class 8-Dsl	T7 CAIRP-Dsl	1,129.3	258,036.5	258,036.5	0	25,951.2	0.0670	0.0153		0.0824				0.0824	0.0589	0.0135		0.0724			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 NNOOS Class 8-Dsl	T7 NNOOS-Dsl	1,056.4	305,078.7	305,078.7	0	24,275.8	0.0912	0.0188		0.1101				0.1101	0.0801	0.0166		0.0967			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 NOOS Class 8-Dsl	T7 NOOS-Dsl	419.4	110,829.7	110,829.7	0	9,637.0	0.0330	0.0072		0.0401				0.0401	0.0290	0.0063		0.0353			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Other Port Class 8-Dsl	T7 Other Port-Dsl	22.8	4,061.2	4,061.2	0	373.7	0.0008	0.0001		0.0009				0.0009	0.0007	0.0001		0.0008			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 POAK Class 8-Dsl	T7 POAK-Dsl	91.4	10,615.0	10,615.0	0	1,495.7	0.0024	0.0004		0.0028				0.0028	0.0021	0.0004		0.0024			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 POLA Class 8-Dsl	T7 POLA-Dsl	105.6	13,512.4	13,512.4	0	1,727.2	0.0028	0.0005		0.0032				0.0032	0.0024	0.0004		0.0028			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 POLA Class 8-NG	T7 POLA-NG	1.66	214.5	214.5	0	27.2	0.0003	0.0001		0.0004				0.0004	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Public Class 8-Dsl	T7 Public-Dsl	345.0	14,547.4	14,547.4	0	1,769.9	0.0036	0.0005		0.0042				0.0042	0.0032	0.0005		0.0037			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Public Class 8-NG	T7 Public-NG	10.1	533.7	533.7	0	52.0	0.0012	0.0003		0.0014				0.0014	0.0000	0.0000		0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 SWCV Class 8-Dsl	T7 SWCV-Dsl	185.6	11,298.7	11,298.7	0	853.7	0.0003	0.0003		0.0005				0.0005	0.0002	0.0002		0.0005			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 SWCV Class 8-NG	T7 SWCV-NG	50.6	3,074.0	3,074.0	0	233.0	0.0262	0.0012		0.0275	0.0015	0.0000		0.0015				0.0015			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Single Concrete/Transit Mix Class 8-Dsl	T7 Single-Dsl	140.8	7,571.4	7,571.4	0	1,326.7	0.0030	0.0004		0.0034	0.0027	0.0004		0.0030				0.0030			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Single Concrete/Transit Mix Class 8-NG	T7 Single-NG	2.33	168.7	168.7	0	22.0	0.0002	0.0001		0.0003	0.0000	0.0000		0.0000				0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Single Dump Class 8-Dsl	T7 Single-Dsl	345.3	27,328.1	27,328.1	0	3,252.3	0.0098	0.0009		0.0107	0.0086	0.0008		0.0094				0.0094			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Single Dump Class 8-NG	T7 Single-NG	5.71	607.7	607.7	0	53.8	0.0007	0.0002		0.0010	0.0000	0.0000		0.0000				0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Single Other Class 8-Dsl	T7 Single-Dsl	668.1	48,313.5	48,313.5	0	6,293.7	0.0192	0.0019		0.0211	0.0169	0.0017		0.0186				0.0186			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Single Other Class 8-NG	T7 Single-NG	10.8	1,054.0	1,054.0	0	101.4	0.0012	0.0004		0.0017	0.0000	0.0000		0.0000				0.0000			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Tractor Class 8-Dsl	T7 Tractor-Dsl	2,377.3	178,764.1	178,764.1	0	34,542.5	0.0679	0.0084		0.0763	0.0597	0.0074		0.0671				0.0671			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Tractor Class 8-NG	T7 Tractor-NG	20.3	1,799.2	1,799.2	0	294.7	0.0020	0.0016		0.0036	0.0000	0.0000		0.0001				0.0001			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Utility Class 8-Dsl	T7 Utility-Dsl	17.5	913.7	913.7	0	224.5	0.0001	0.0000		0.0001				0.0001	0.0001	0.0000		0.0001			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7IS-Gas	T7IS - Gas	2.74	176.4	176.4	0	54.9	0.0003		0	0.0003	0.0000	0.0000	0.0001	0.0004	0.0002		0	0.0002	0.0000	0.0000	0.0001
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	UBUS-Dsl	UBUS - Dsl	102.5	9,035.0	9,035.0	0	410.2	0.0012			0.0012				0.0012	0.0011			0.0011			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	UBUS-Elec	UBUS - Oth	1.87	129.3	0	129.3	7.50				0				0				0			
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	UBUS-Gas	UBUS - Gas	18.3	1,270.0	1,270.0	0	73.4	0.0000		0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000		0.0000	0.0001	0.0000	0.0000	0.0000
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	UBUS-NG	UBUS - NG	31.8	1,798.7	1,798.7	0	127.0	0.0023			0.0023				0.0023	0.0004			0.0004			

ROG_TOTAL	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	NOx_RUNEX	NOx_IDLEX	NOx_STREX	NOx_TOTEX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CO2_TOTEX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_TOTEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_TOTEX	PM2_5_PMTW	PM2_5_PMBW	PM2_5_TOTAL	SOx_RUNEX	SOx_IDLEX
5.85	39.4	0.5729	14.6	54.6	14.8	0.8874	1.56	17.3	8,937.0	125.2	169.3	9,231.4	0.2998	0.0055	0.0063	0.3116	0.1838	0.3281	0.8235	0.2856	0.0053	0.0058	0.2968	0.0459	0.1148	0.4576	0.0886	0.0012
0.0049	0.0114	0.0003		0.0117	0.0392	0.0007	0.0000	0.0400	4.22	0.0471		4.26	0.0021	0.0000		0.0021	0.0000	0.0002	0.0023	0.0020	0.0000		0.0020	0.0000	0.0001	0.0021	0.0000	0.0000
0.0018	0.0193			0.0193	0.0172			0.0172	11.6			11.6	0.0011			0.0011	0.0004	0.0004	0.0019	0.0010			0.0010	0.0001	0.0001	0.0013	0.0001	
0				0				0				0				0	0.0002	0.0001	0.0003				0	0.0001	0.0000	0.0001		
2.15	16.4		6.61	23.0	1.29		0.4826	1.78	3,008.4		77.7	3,086.0	0.0162		0.0031	0.0193	0.0765	0.0818	0.1775	0.0149		0.0028	0.0177	0.0191	0.0286	0.0655	0.0303	
0.0024	0.0200		0.0074	0.0275	0.0003		0.0006	0.0009	11.8		0.3774	12.2	0.0001		0.0000	0.0001	0.0006	0.0003	0.0010	0.0001		0.0000	0.0001	0.0001	0.0001	0.0003	0.0001	
0.0002	0.0010			0.0010	0.0010			0.0010	0.3380			0.3380	0.0001			0.0001	0.0000	0.0000	0.0001	0.0001			0.0001	0.0000	0.0000	0.0001	0.0000	
0				0				0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000		
0.4672	3.12		1.24	4.36	0.2986		0.0761	0.3746	305.3		9.11	314.4	0.0031		0.0006	0.0037	0.0067	0.0086	0.0190	0.0029		0.0006	0.0034	0.0017	0.0030	0.0081	0.0031	
0.0002	0.0014			0.0014	0.0009			0.0009	2.18			2.18	0.0001			0.0001	0.0001	0.0001	0.0002	0.0001			0.0001	0.0000	0.0000	0.0002	0.0000	
0				0				0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000		
0.8643	7.08		2.83	9.91	0.8565		0.2924	1.15	1,212.9		33.9	1,246.9	0.0056		0.0011	0.0067	0.0234	0.0296	0.0596	0.0052		0.0010	0.0062	0.0058	0.0103	0.0223	0.0122	
0.0000	0.0001		0.0000	0.0002	0.0000		0.0000	0.0000	0.0673		0.0025	0.0699	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
0.1043	0.3154	0.0083		0.3237	1.31	0.0235		1.34	216.9	1.29		218.2	0.0249	0.0003		0.0251	0.0041	0.0269	0.0562	0.0238	0.0003		0.0240	0.0010	0.0094	0.0345	0.0021	0.0000
0.1804	0.8933	0.0331	0.3814	1.31	0.1531	0.0004	0.0945	0.2479	294.9	1.04	2.53	298.4	0.0010		0.0001	0.0011	0.0023	0.0228	0.0262	0.0009		0.0001	0.0010	0.0006	0.0080	0.0096	0.0030	0.0000
0.0264	0.0753	0.0024		0.0777	0.3094	0.0067		0.3160	81.2	0.5842		81.8	0.0061	0.0001		0.0062	0.0012	0.0094	0.0168	0.0058	0.0001		0.0059	0.0003	0.0033	0.0095	0.0008	0.0000
0.0183	0.0780	0.0040	0.0495	0.1315	0.0173	0.0000	0.0117	0.0291	41.4	0.1456	0.3382	41.9	0.0001		0.0000	0.0001	0.0003	0.0033	0.0037	0.0001		0.0000	0.0001	0.0001	0.0012	0.0013	0.0004	0.0000
0.4423	1.48		0.2239	1.70	0.0615		0.0056	0.0671	12.3		1.09	13.4	0.0002		0.0001	0.0003	0.0003	0.0009	0.0015	0.0001		0.0001	0.0002	0.0001	0.0003	0.0006	0.0002	
0.0009	0.0119			0.0119	0.0058			0.0058	19.6			19.6	0.0004			0.0004	0.0004	0.0004	0.0012	0.0004			0.0004	0.0001	0.0001	0.0007	0.0002	
0				0				0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000		
1.07	7.87		3.17	11.0	1.10		0.4074	1.51	1,436.7		43.4	1,480.1	0.0058		0.0013	0.0070	0.0233	0.0304	0.0608	0.0053		0.0012	0.0065	0.0058	0.0107	0.0230	0.0145	
0.0001	0.0005		0.0002	0.0007	0.0000		0.0000	0.0000	0.3166		0.0148	0.3314	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
0.0009	0.0033			0.0033	0.0375			0.0375	6.32			6.32	0.0011			0.0011	0.0001	0.0003	0.0015	0.0010			0.0010	0.0000	0.0001	0.0012	0.0001	
0.0188	0.0836		0.0009	0.0845	0.0145		0.0001	0.0146	32.8		0.0053	32.8	0.0000		0.0000	0.0000	0.0002	0.0008	0.0010	0.0000		0.0000	0.0000	0.0001	0.0003	0.0004	0.0003	
0.0011	0.0031	0.0011		0.0042	0.0183	0.0024	0.0004	0.0210	4.04	0.2215		4.26	0.0005	0.0000		0.0005	0.0000	0.0002	0.0008	0.0005	0.0000		0.0005	0.0000	0.0001	0.0006	0.0000	0.0000
0.0049	0.0503	0.0012	0.0223	0.0738	0.0146	0.0000	0.0020	0.0166	21.1	0.0795	0.1114	21.3	0.0000		0.0000	0.0000	0.0001	0.0005	0.0007	0.0000		0.0000	0.0000	0.0000	0.0002	0.0002	0.0002	0.0000
0.0121	0.0435			0.0435	0.1750			0.1750	41.4			41.4	0.0049			0.0049			0.0049	0.0046			0.0046			0.0046	0.0004	
0				0				0				0				0			0				0			0		
0.0012	0.0031	0.0017		0.0048	0.0811	0.0162	0.0024	0.0997	13.4	1.29		14.7	0.0005	0.0000		0.0005	0.0001	0.0005	0.0012	0.0005	0.0000		0.0005	0.0000	0.0002	0.0007	0.0001	0.0000
0.0033	0.0569	0.0032	0.0022	0.0623	0.0038	0.0000	0.0001	0.0039	1.90	0.1038	0.0076	2.01	0.0000		0.0000	0.0000	0.0000	0.0001	0.0001	0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
0.0001	0.0181	0.0010		0.0191	0.0009	0.0003		0.0013	1.73	0.2259		1.96	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0001	0.0003	0.0000		0.0003	0.0022	0.0001	0.0001	0.0023	0.6882	0.0057		0.6939	0.0001	0.0000		0.0001	0.0000	0.0000	0.0001	0.0001	0.0000		0.0001	0.0000	0.0000	0.0001	0.0000	0.0000
0.0001	0.0004	0.0000		0.0005	0.0030	0.0001	0.0001	0.0031	0.9440	0.0074		0.9514	0.0001	0.0000		0.0001	0.0000	0.0000	0.0002	0.0001	0.0000		0.0001	0.0000	0.0000	0.0001	0.0000	0.0000
0.0003	0.0011	0.0001		0.0012	0.0078	0.0002	0.0002	0.0082	2.47	0.0191		2.49	0.0003	0.0000		0.0003	0.0000	0.0001	0.0004	0.0003	0.0000		0.0003	0.0000	0.0000	0.0003	0.0000	0.0000
0.0019	0.0066	0.0002		0.0068	0.0474	0.0006	0.0007	0.0487	14.8	0.0614		14.9	0.0017	0.0000		0.0017	0.0002	0.0006	0.0025	0.0016	0.0000		0.0016	0.0000	0.0002	0.0019	0.0001	0.0000
0.0049	0.0121	0.0028		0.0149	0.0581	0.0094	0.0017	0.0692	9.66	0.6764		10.3	0.0022	0.0001		0.0023	0.0001	0.0004	0.0027	0.0021	0.0001		0.0022	0.0000	0.0001	0.0023	0.0001	0.0000
0.0032	0.0079	0.0021		0.0099	0.0378	0.0068	0.0012	0.0459	6.28	0.4942		6.78	0.0014	0.0001		0.0015	0.0001	0.0002	0.0018	0.0014	0.0001		0.0014	0.0000	0.0001	0.0015	0.0001	0.0000
0.0138	0.0341	0.0070		0.0411	0.1641	0.0232	0.0041	0.1914	27.3	1.67		28.9	0.0062	0.0002		0.0064	0.0003	0.0010	0.0077	0.0059	0.0002		0.0061	0.0001	0.0004	0.0066	0.0003	0.0000
0.0043	0.0102	0.0028		0.0129	0.0551	0.0098	0.0016	0.0665	8.28	0.7361		9.02	0.0018	0.0001		0.0019	0.0001	0.0003	0.0023	0.0017	0.0001		0.0019	0.0000	0.0001	0.0020	0.0001	0.0000
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000	0.0004	0.0001		0.0005	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0080	0.0208	0.0061		0.0269	0.1146	0.0202	0.0031	0.1379	19.9	1.45		21.3	0.0042	0.0002		0.0044	0.0002	0.0008	0.0054	0.0040	0.0002		0.0042	0.0001	0.0003	0.0045	0.0002	0.0000
0.0217	0.0584	0.0097		0.0681	0.3222	0.0321	0.0050	0.3592	56.1	2.31		58.4	0.0118	0.0003		0.0121	0.0006	0.0022	0.0148	0.0113	0.0003		0.0116	0.0001	0.0008	0.0125	0.0005	0.0000
0.0167	0.0442	0.0097		0.0539	0.2426	0.0319	0.0049	0.2793	41.7	2.29		44.0	0.0089	0.0003		0.0093	0.0004	0.0016	0.0113	0.0085	0.0003		0.0089	0.0001	0.0006	0.0095	0.0004	0.0000
0.0105	0.0252	0.0099		0.0350	0.1597	0.0340	0.0049	0.1986	28.4	2.55		31.0	0.0049	0.0004		0.0053	0.0003	0.0011	0.0067	0.0047	0.0004		0.0051	0.0001	0.0004	0.0055	0.0003	0.0000
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000	0.0021	0.0002		0.0023	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0002	0.0005	0.0001		0.0007	0.0030	0.0004	0.0001	0.0034	0.5509	0.0260		0.5769	0.0001	0.0000		0.0001	0.0000	0.0000	0.0001	0.0001	0.0000		0.0001	0.0000	0.0000	0.0001	0.0000	0.0000
0.0181	0.0471	0.0054		0.0525	0.2919	0.0188	0.0026	0.3133	46.6	1.39		48.0	0.0094	0.0002		0.0096	0.0005	0.0018	0.0119	0.0090	0.0002		0.0092	0.0001	0.0006	0.0099	0.0004	0.0000
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000	0.0031	0.0001		0.0032	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0001	0.0002	0.0000		0.0002	0.0012	0.0000	0.0000	0.0013	0.3940	0.0033		0.3973	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
0.0001	0.0002	0.0000		0.0003	0.0017	0.0000	0.0000	0.0018	0.5405	0.0042		0.5447	0.0001	0.0000		0.0001	0.0000	0.0000	0.0001	0.0001	0.0000		0.0001	0.0000	0.0000	0.0001	0.0000	0.0000
0.0002	0.0006	0.0000		0.0007	0.0045	0.0001	0.0001	0.0047	1.41	0.0110		1.42	0.0002	0.0000		0.0002	0.0000	0.0001	0.0002	0.0002	0.0000		0.0002	0.0000	0.0000	0.0002	0.0000	0.0000
0.0014	0.0047	0.0001		0.0048	0.0327	0.0003	0.0004	0.0335	9.85	0.0352		9.89	0.0012	0.0000		0.0012	0.0001	0.0004	0.0017	0.0011	0.0000		0.0011	0.0000	0.0001	0.0013	0.0001	0.0000
0.0001	0.0002	0.0002		0.0004	0.0087	0.0029	0.0001	0.0117	1.29	0.1952		1.49	0.0000	0.0000		0.0001	0.0000	0.0000	0.0001	0.0000	0.0000		0.0001	0.0000	0.0000	0.0001	0.0000	0.0000
0.0000	0.0000	0.0000		0.0001	0.0000	0.0000		0.0000	0.0120	0.0030		0.0151	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0002	0.0005	0.0004		0.0009	0.0147	0.0032	0.0003	0.0182	3.50	0.2684		3.77	0.0001	0.0000		0.0001	0.0000	0.0001	0.0002	0.0001	0.0000		0.0001	0.0000	0.0000	0.0001	0.0000	0.0000
0.0000	0.0002	0.0000		0.0003	0.0000	0.0000		0.0000	0.0765	0.0106		0.0871	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0006	0.0013	0.0004		0.0017	0.0421	0.0037	0.0001	0.0459	5.63	0.2641		5.90	0.0003	0.0000		0.0003	0.0001	0.0002	0.0006	0.0003	0.0000		0.0003	0.0000	0.0001	0.0004	0.0001	0.0000
0.0000	0.0002	0.0000		0.0002	0.0000	0.0000		0.0000	0.0590	0.0048		0.0638	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0012	0.0022	0.0009		0.0032	0.0692	0.0085	0.0003	0.0780	8.81	0.6119		9.42	0.0005	0.0000		0.0006	0.0001	0.0003	0.0010	0.0005	0.0000		0.0005	0.0000	0.0001	0.0007	0.0001	0.0000
0.0000	0.0003	0.0000		0.0004	0.0000	0.0000		0.0001	0.1083	0.0110		0.1194	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0001	0.0002	0.0002		0.0003	0.0029	0.0007	0.0005	0.0041	1.47	0.0815		1.55	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000	0.0025	0.0003		0.0028	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0000	0.0000	0.0000		0.0001	0.0008	0.0002	0.0001	0.0011	0.2735	0.0215		0.2951	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000	0.0007	0.0001		0.0008	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0000	0.0000	0.0001		0.0001	0.0010	0.0003	0.0002	0.0015	0.3850	0.0354		0.4203	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000	0.0010	0.0002		0.0011	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0467	0.3792	0.0097	0.1082	0.4971	0.0534	0.0001	0.0069	0.0604	51.1	0.3549	0.7129	52.2	0.0001		0.0000	0.0002	0.0003	0.0012	0.0017	0.0001		0.0000	0.0001	0.0001	0.0004	0.0006	0.0005	0.0000
0.0724	0.2132	0.1242		0.3374	1.73	0.1757	0.0304	1.94	446.7	30.9		477.6	0.0379	0.0007		0.0387	0.0102	0.0234	0.0723	0.0363	0.0007		0.0370	0.0026	0.0082	0.0477	0.0043	0.0003
0.0967	0.3134	0.1627		0.4761	1.80	0.1740	0.0354	2.01	529.2	33.3		562.4	0.0581	0.0012		0.0593	0.0121	0.0273	0.0986	0.0556	0.0011		0.0567	0.0030	0.0095	0.0693	0.0050	0.0003
0.0353	0.1041	0.0573		0.1613	0.7761	0.0804	0.0113	0.8678	191.9	14.2		206.1	0.0181	0.0004		0.0184	0.0044	0.0101	0.0329	0.0173	0.0004		0.0176	0.0011	0.0035	0.0223	0.0018	0.0001
0.0008	0.0021	0.0007		0.0028	0.0244	0.0018	0.0003	0.0266	7.73	0.2582		7.99	0.0002	0.0000		0.0002	0.0002	0.0004	0.0008	0.0002	0.0000		0.0002	0.0000	0.0002	0.0003	0.0001	0.0000
0.0024	0.0063	0.0029		0.0092	0.0682	0.0075	0.0013	0.0770	20.2	1.03		21.3	0.0006	0.0000		0.0006	0.0004	0.0012	0.0022	0.0005	0.0000		0.0005	0.0001	0.0004	0.0010	0.0002	0.0000
0.0028	0.0071	0.0032		0.0104	0.0852	0.0084	0.0015	0.0951	25.8	1.19		27.0	0.0005	0.0000		0.0005	0.0005	0.0015	0.0026	0.0005	0.0000		0.0005	0.0001	0.0005	0.0012	0.0002	0.0000
0.0000	0.0026	0.0001		0.0027	0.0002	0.0000		0.0002	0.3318	0.0297		0.3615	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0037	0.0102	0.0022		0.0124	0.2410	0.0170	0.0016	0.2596	31.9	1.31		33.2	0.0016	0.0001		0.0017	0.0006	0.0020	0.0043	0.0016	0.0001		0.0016	0.0001	0.0007	0.0025	0.0003	0.0000
0.0000	0.0074	0.0003		0.0076	0.0006	0.0001		0.0007	0.9546	0.0609		1.02	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0005	0.0007	0.0014		0.0021	0.1554	0.0104	0.0009	0.1667	52.2	0.7997		53.0	0.0002	0.0000		0.0002	0.0004	0.0026	0.0033	0.0002	0.0000		0.0002	0.0001	0.0009	0.0012	0.0005	0.0000
0.0015	0.0817	0.0043		0.0860	0.0226	0.0006		0.0232	6.39	0.3697		6.76	0.0000	0.0000		0.0000	0.0001	0.0007	0.0009	0.0000	0.0000		0.0000	0.0000	0.0002	0.0003		
0.0030	0.0096	0.0025		0.0121	0.0604	0.0044	0.0015	0.0663	13.9	0.5031		14.4	0.0017	0.0000		0.0017	0.0003	0.0008	0.0028	0.0016	0.0000		0.0017	0.0001	0.0003	0.0020	0.0001	0.0000
0.0000	0.0019	0.0001		0.0020	0.0001	0.0000		0.0001	0.2395	0.0220		0.2615	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0094	0.0316	0.0058		0.0374	0.2188	0.0108	0.0038	0.2334	50.4	1.23		51.7	0.0056	0.0001		0.0057	0.0011	0.0028	0.0096	0.0053	0.0001		0.0054	0.0003	0.0010	0.0067	0.0005	0.0000
0.0000	0.0070	0.0002		0.0073	0.0004	0.0001		0.0005	0.8628	0.0539		0.9167	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0186	0.0617	0.0114		0.0731	0.3974	0.0208	0.0071	0.4253	89.1	2.36		91.5	0.0109	0.0002		0.0111	0.0019	0.0050	0.0180	0.0104	0.0002		0.0106	0.0005	0.0017	0.0128	0.0009	0.0000
0.0000	0.0122	0.0004		0.0126	0.0007	0.0001		0.0009	1.50	0.1015		1.60	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000		
0.0671	0.2109	0.0670		0.2779	1.59	0.1165	0.0500	1.76	314.1	16.4		330.5	0.0346	0.0004		0.0350	0.0071	0.0180	0.0601	0.0331	0.0004		0.0335	0.0018	0.0063	0.0415	0.0030	0.0002
0.0001	0.0204	0.0016		0.0219	0.0012	0.0005		0.0017	2.46	0.3496		2.81	0.0000	0.0000		0.0000	0.0001	0.0002	0.0002	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001		
0.0001	0.0003	0.0001		0.0004	0.0045	0.0003	0.0006	0.0055	1.79	0.0349		1.83	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
0.0003	0.0136		0.0005	0.0141	0.0016		0.0000	0.0016	0.4831		0.0029	0.4860	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
0.0011	0.0048			0.0048	0.0694			0.0694	12.9			12.9	0.0002			0.0002	0.0003	0.0011	0.0015	0.0002			0.0002	0.0001	0.0004	0.0006	0.0001	
0				0				0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000		
0.0001	0.0004		0.0007	0.0011	0.0003		0.0001	0.0004	2.37		0.0066	2.38	0.0000		0.0000	0.0000	0.0000	0.0001	0.0002	0.0000		0.0000	0.0000	0.0000	0.0001	0.0001	0.0000	
0.0004	0.0071			0.0071	0.0049			0.0049	1.76			1.76	0.0000			0.0000	0.0000	0.0002	0.0003	0.0000			0.0000	0.0000	0.0001	0.0001		

SOx_STREX	SOx_TOTEX	Fuel_GAS	Fuel_DSL	Fuel_NG
0.0020	0.0917	713.0	234.8	2.18
	0.0000		0.3837	
	0.0001		1.05	
	0			
0.0009	0.0312	332.8		
0.0000	0.0001	1.30		
	0.0000		0.0304	
	0			
0.0001	0.0032	34.3		
	0.0000		0.1962	
	0			
0.0004	0.0126	134.6		
0.0000	0.0000	0.0075		
	0.0021		19.6	
0.0000	0.0030	32.0		
	0.0008		7.36	
0.0000	0.0004	4.49		
0.0000	0.0002	1.78		
	0.0002		1.76	
	0			
0.0005	0.0150	159.7		
0.0000	0.0000	0.0354		
	0.0001		0.5688	
0.0000	0.0003	3.51		
	0.0000		0.3831	
0.0000	0.0002	2.28		
	0.0004		3.73	
	0			
	0.0001		1.32	
0.0000	0.0000	0.2260		
	0			0.2411
	0.0000		0.0624	
	0.0000		0.0856	
	0.0000		0.2237	
	0.0001		1.34	
	0.0001		0.9301	
	0.0001		0.6099	
	0.0003		2.60	
	0.0001		0.8118	
	0			0.0001
	0.0002		1.92	
	0.0006		5.26	
	0.0004		3.96	
	0.0003		2.79	
	0			0.0003
	0.0000		0.0519	
	0.0005		4.32	
	0			0.0004
	0.0000		0.0358	
	0.0000		0.0490	
	0.0000		0.1281	
	0.0001		0.8898	
	0.0000		0.1340	
	0			0.0019
	0.0000		0.3390	
	0			0.0107
	0.0001		0.5306	
	0			0.0078
	0.0001		0.8478	
	0			0.0147
	0.0000		0.1397	
	0			0.0003
	0.0000		0.0266	
	0			0.0001
	0.0000		0.0378	
	0			0.0001
0.0000	0.0005	5.65		
	0.0046		43.0	
	0.0054		50.6	
	0.0020		18.5	
	0.0001		0.7189	
	0.0002		1.91	
	0.0003		2.43	
	0			0.0445
	0.0003		2.99	
	0			0.1249
	0.0005		4.77	
	0			0.8312
	0.0001		1.30	
	0			0.0322
	0.0005		4.65	
	0			0.1128
	0.0009		8.23	
	0			0.1965
	0.0032		29.7	
	0			0.3455
	0.0000		0.1646	
0.0000	0.0000	0.0542		
	0.0001		1.16	
	0			
0.0000	0.0000	0.2536		
	0			0.2167

Group	Area	GAI	Sub-Area	Cal. Year	Season	Title	Veh_Tech	EMFAC2011 Category	Population	Total_VMT	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	NOx_RUNEX
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	All Other Buses-Dsl	All Other Buses - Dsl	65.3	2,971.9	0.0114	0.0003		0.0117	0.0392
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDA-Dsl	LDA - Dsl	1,087.1	43,402.5	0.0193			0.0193	0.0172
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDT1-Dsl	LDT1 - Dsl	35.8	690.1	0.0010			0.0010	0.0010
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LDT2-Dsl	LDT2 - Dsl	125.8	5,805.2	0.0014			0.0014	0.0009
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LHD1-Dsl	LHD1 - Dsl	8,282.0	313,153.5	0.3154	0.0083		0.3237	1.31
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	LHD2-Dsl	LHD2 - Dsl	2,351.0	93,437.0	0.0753	0.0024		0.0777	0.3094
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	MDV-Dsl	MDV - Dsl	867.2	40,555.9	0.0119			0.0119	0.0058
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	MH-Dsl	MH - Dsl	556.6	5,378.7	0.0033			0.0033	0.0375
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	Motor Coach-Dsl	Motor Coach - Dsl	17.6	2,185.0	0.0031	0.0011		0.0042	0.0183
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	PTO-Dsl	PTO-Dsl	0	16,886.4	0.0435			0.0435	0.1750
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	SBUS-Dsl	SBUS - Dsl	500.3	10,546.5	0.0031	0.0017		0.0048	0.0811
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 CAIRP Class 4-Dsl	T6 CAIRP small-Dsl	7.61	577.8	0.0003	0.0000		0.0003	0.0022
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 CAIRP Class 5-Dsl	T6 CAIRP small-Dsl	9.86	792.6	0.0004	0.0000		0.0005	0.0030
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 CAIRP Class 6-Dsl	T6 CAIRP small-Dsl	25.5	2,071.0	0.0011	0.0001		0.0012	0.0078
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 CAIRP Class 7-Dsl	T6 CAIRP heavy-Dsl	83.2	12,990.6	0.0066	0.0002		0.0068	0.0474
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Delivery Class 4-Dsl	T6 instate small-Dsl	269.7	6,981.6	0.0121	0.0028		0.0149	0.0581
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Delivery Class 5-Dsl	T6 instate small-Dsl	197.1	4,541.2	0.0079	0.0021		0.0099	0.0378
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Delivery Class 6-Dsl	T6 instate small-Dsl	667.1	19,707.7	0.0341	0.0070		0.0411	0.1641
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Delivery Class 7-Dsl	T6 instate heavy-Dsl	293.7	5,919.5	0.0102	0.0028		0.0129	0.0551
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Other Class 4-Dsl	T6 instate small-Dsl	539.1	15,516.3	0.0208	0.0061		0.0269	0.1146
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Other Class 5-Dsl	T6 instate small-Dsl	858.5	43,807.8	0.0584	0.0097		0.0681	0.3222
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Other Class 6-Dsl	T6 instate small-Dsl	850.8	32,537.7	0.0442	0.0097		0.0539	0.2426
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Other Class 7-Dsl	T6 instate heavy-Dsl	946.1	22,176.4	0.0252	0.0099		0.0350	0.1597
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Tractor Class 6-Dsl	T6 instate small-Dsl	9.68	430.8	0.0005	0.0001		0.0007	0.0030
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Instate Tractor Class 7-Dsl	T6 instate heavy-Dsl	518.6	37,176.3	0.0471	0.0054		0.0525	0.2919
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 OOS Class 4-Dsl	T6 OOS small-Dsl	4.36	330.8	0.0002	0.0000		0.0002	0.0012
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 OOS Class 5-Dsl	T6 OOS small-Dsl	5.66	453.8	0.0002	0.0000		0.0003	0.0017
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 OOS Class 6-Dsl	T6 OOS small-Dsl	14.6	1,185.8	0.0006	0.0000		0.0007	0.0045
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 OOS Class 7-Dsl	T6 OOS heavy-Dsl	47.7	8,622.0	0.0047	0.0001		0.0048	0.0327
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Public Class 4-Dsl	T6 Public-Dsl	49.0	924.8	0.0002	0.0002		0.0004	0.0087
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Public Class 5-Dsl	T6 Public-Dsl	66.6	2,551.6	0.0005	0.0004		0.0009	0.0147
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Public Class 6-Dsl	T6 Public-Dsl	70.0	3,948.8	0.0013	0.0004		0.0017	0.0421
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Public Class 7-Dsl	T6 Public-Dsl	167.7	6,139.7	0.0022	0.0009		0.0032	0.0692
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Utility Class 5-Dsl	T6 Utility-Dsl	39.5	1,154.8	0.0002	0.0002		0.0003	0.0029
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Utility Class 6-Dsl	T6 Utility-Dsl	10.3	218.1	0.0000	0.0000		0.0001	0.0008
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T6 Utility Class 7-Dsl	T6 Utility-Dsl	16.9	303.3	0.0000	0.0001		0.0001	0.0010
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 CAIRP Class 8-Dsl	T7 CAIRP-Dsl	1,129.3	258,036.5	0.2132	0.1242		0.3374	1.73
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 NNOOS Class 8-Dsl	T7 NNOOS-Dsl	1,056.4	305,078.7	0.3134	0.1627		0.4761	1.80
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 NOOS Class 8-Dsl	T7 NOOS-Dsl	419.4	110,829.7	0.1041	0.0573		0.1613	0.7761
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Other Port Class 8-Dsl	T7 Other Port-Dsl	22.8	4,061.2	0.0021	0.0007		0.0028	0.0244
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 POAK Class 8-Dsl	T7 POAK-Dsl	91.4	10,615.0	0.0063	0.0029		0.0092	0.0682
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 POLA Class 8-Dsl	T7 POLA-Dsl	105.6	13,512.4	0.0071	0.0032		0.0104	0.0852
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Public Class 8-Dsl	T7 Public-Dsl	345.0	14,547.4	0.0102	0.0022		0.0124	0.2410
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 SWCV Class 8-Dsl	T7 SWCV-Dsl	185.6	11,298.7	0.0007	0.0014		0.0021	0.1554
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Single Concrete/Transit Mix Class 8-Dsl	T7 Single-Dsl	140.8	7,571.4	0.0096	0.0025		0.0121	0.0604
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Single Dump Class 8-Dsl	T7 Single-Dsl	345.3	27,328.1	0.0316	0.0058		0.0374	0.2188
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Single Other Class 8-Dsl	T7 Single-Dsl	668.1	48,313.5	0.0617	0.0114		0.0731	0.3974
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Tractor Class 8-Dsl	T7 Tractor-Dsl	2,377.3	178,764.1	0.2109	0.0670		0.2779	1.59
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	T7 Utility Class 8-Dsl	T7 Utility-Dsl	17.5	913.7	0.0003	0.0001		0.0004	0.0045
1	SJCOG		All Sub-Areas	2016	Annual	Areas-2016	UBUS-Dsl	UBUS - Dsl	102.5	9,035.0	0.0048			0.0048	0.0694
								TOTALs	26,664.8	1,765,978.7	1.7	0.5	0.0	2.3	10.9

NOx_IDLEX	NOx_STREX	NOx_TOTEX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_TOTEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_TOTEX	PM2_5_PMTW	PM2_5_PMBW
0.0007	0.0000	0.0400	0.0021	0.0000		0.0021	0.0000	0.0002	0.0023	0.0020	0.0000		0.0020	0.0000	0.0001
		0.0172	0.0011			0.0011	0.0004	0.0004	0.0019	0.0010			0.0010	0.0001	0.0001
		0.0010	0.0001			0.0001	0.0000	0.0000	0.0001	0.0001			0.0001	0.0000	0.0000
		0.0009	0.0001			0.0001	0.0001	0.0001	0.0002	0.0001			0.0001	0.0000	0.0000
0.0235		1.34	0.0249	0.0003		0.0251	0.0041	0.0269	0.0562	0.0238	0.0003		0.0240	0.0010	0.0094
0.0067		0.3160	0.0061	0.0001		0.0062	0.0012	0.0094	0.0168	0.0058	0.0001		0.0059	0.0003	0.0033
		0.0058	0.0004			0.0004	0.0004	0.0004	0.0012	0.0004			0.0004	0.0001	0.0001
		0.0375	0.0011			0.0011	0.0001	0.0003	0.0015	0.0010			0.0010	0.0000	0.0001
0.0024	0.0004	0.0210	0.0005	0.0000		0.0005	0.0000	0.0002	0.0008	0.0005	0.0000		0.0005	0.0000	0.0001
		0.1750	0.0049			0.0049			0.0049	0.0046			0.0046		
0.0162	0.0024	0.0997	0.0005	0.0000		0.0005	0.0001	0.0005	0.0012	0.0005	0.0000		0.0005	0.0000	0.0002
0.0001	0.0001	0.0023	0.0001	0.0000		0.0001	0.0000	0.0000	0.0001	0.0001	0.0000		0.0001	0.0000	0.0000
0.0001	0.0001	0.0031	0.0001	0.0000		0.0001	0.0000	0.0000	0.0002	0.0001	0.0000		0.0001	0.0000	0.0000
0.0002	0.0002	0.0082	0.0003	0.0000		0.0003	0.0000	0.0001	0.0004	0.0003	0.0000		0.0003	0.0000	0.0000
0.0006	0.0007	0.0487	0.0017	0.0000		0.0017	0.0002	0.0006	0.0025	0.0016	0.0000		0.0016	0.0000	0.0002
0.0094	0.0017	0.0692	0.0022	0.0001		0.0023	0.0001	0.0004	0.0027	0.0021	0.0001		0.0022	0.0000	0.0001
0.0068	0.0012	0.0459	0.0014	0.0001		0.0015	0.0001	0.0002	0.0018	0.0014	0.0001		0.0014	0.0000	0.0001
0.0232	0.0041	0.1914	0.0062	0.0002		0.0064	0.0003	0.0010	0.0077	0.0059	0.0002		0.0061	0.0001	0.0004
0.0098	0.0016	0.0665	0.0018	0.0001		0.0019	0.0001	0.0003	0.0023	0.0017	0.0001		0.0019	0.0000	0.0001
0.0202	0.0031	0.1379	0.0042	0.0002		0.0044	0.0002	0.0008	0.0054	0.0040	0.0002		0.0042	0.0001	0.0003
0.0321	0.0050	0.3592	0.0118	0.0003		0.0121	0.0006	0.0022	0.0148	0.0113	0.0003		0.0116	0.0001	0.0008
0.0319	0.0049	0.2793	0.0089	0.0003		0.0093	0.0004	0.0016	0.0113	0.0085	0.0003		0.0089	0.0001	0.0006
0.0340	0.0049	0.1986	0.0049	0.0004		0.0053	0.0003	0.0011	0.0067	0.0047	0.0004		0.0051	0.0001	0.0004
0.0004	0.0001	0.0034	0.0001	0.0000		0.0001	0.0000	0.0000	0.0001	0.0001	0.0000		0.0001	0.0000	0.0000
0.0188	0.0026	0.3133	0.0094	0.0002		0.0096	0.0005	0.0018	0.0119	0.0090	0.0002		0.0092	0.0001	0.0006
0.0000	0.0000	0.0013	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000
0.0000	0.0000	0.0018	0.0001	0.0000		0.0001	0.0000	0.0000	0.0001	0.0001	0.0000		0.0001	0.0000	0.0000
0.0001	0.0001	0.0047	0.0002	0.0000		0.0002	0.0000	0.0001	0.0002	0.0002	0.0000		0.0002	0.0000	0.0000
0.0003	0.0004	0.0335	0.0012	0.0000		0.0012	0.0001	0.0004	0.0017	0.0011	0.0000		0.0011	0.0000	0.0001
0.0029	0.0001	0.0117	0.0000	0.0000		0.0001	0.0000	0.0000	0.0001	0.0000	0.0000		0.0001	0.0000	0.0000
0.0032	0.0003	0.0182	0.0001	0.0000		0.0001	0.0000	0.0001	0.0002	0.0001	0.0000		0.0001	0.0000	0.0000
0.0037	0.0001	0.0459	0.0003	0.0000		0.0003	0.0001	0.0002	0.0006	0.0003	0.0000		0.0003	0.0000	0.0001
0.0085	0.0003	0.0780	0.0005	0.0000		0.0006	0.0001	0.0003	0.0010	0.0005	0.0000		0.0005	0.0000	0.0001
0.0007	0.0005	0.0041	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000
0.0002	0.0001	0.0011	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
0.0003	0.0002	0.0015	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
0.1757	0.0304	1.94	0.0379	0.0007		0.0387	0.0102	0.0234	0.0723	0.0363	0.0007		0.0370	0.0026	0.0082
0.1740	0.0354	2.01	0.0581	0.0012		0.0593	0.0121	0.0273	0.0986	0.0556	0.0011		0.0567	0.0030	0.0095
0.0804	0.0113	0.8678	0.0181	0.0004		0.0184	0.0044	0.0101	0.0329	0.0173	0.0004		0.0176	0.0011	0.0035
0.0018	0.0003	0.0266	0.0002	0.0000		0.0002	0.0002	0.0004	0.0008	0.0002	0.0000		0.0002	0.0000	0.0002
0.0075	0.0013	0.0770	0.0006	0.0000		0.0006	0.0004	0.0012	0.0022	0.0005	0.0000		0.0005	0.0001	0.0004
0.0084	0.0015	0.0951	0.0005	0.0000		0.0005	0.0005	0.0015	0.0026	0.0005	0.0000		0.0005	0.0001	0.0005
0.0170	0.0016	0.2596	0.0016	0.0001		0.0017	0.0006	0.0020	0.0043	0.0016	0.0001		0.0016	0.0001	0.0007
0.0104	0.0009	0.1667	0.0002	0.0000		0.0002	0.0004	0.0026	0.0033	0.0002	0.0000		0.0002	0.0001	0.0009
0.0044	0.0015	0.0663	0.0017	0.0000		0.0017	0.0003	0.0008	0.0028	0.0016	0.0000		0.0017	0.0001	0.0003
0.0108	0.0038	0.2334	0.0056	0.0001		0.0057	0.0011	0.0028	0.0096	0.0053	0.0001		0.0054	0.0003	0.0010
0.0208	0.0071	0.4253	0.0109	0.0002		0.0111	0.0019	0.0050	0.0180	0.0104	0.0002		0.0106	0.0005	0.0017
0.1165	0.0500	1.76	0.0346	0.0004		0.0350	0.0071	0.0180	0.0601	0.0331	0.0004		0.0335	0.0018	0.0063
0.0003	0.0006	0.0055	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000	0.0000	0.0000
		0.0694	0.0002			0.0002	0.0003	0.0011	0.0015	0.0002			0.0002	0.0001	0.0004
0.9	0.2	12.0	0.3	0.0	0.0	0.3	0.0	0.1	0.5	0.3	0.0	0.0	0.3	0.0	0.1

PM2_5_TOTAL	**SOx_RUNEX**	**SOx_IDLEX**	**SOx_STREX**	SOx_TOTEX
0.0021	0.0000	0.0000		0.0000
0.0013	0.0001			0.0001
0.0001	0.0000			0.0000
0.0002	0.0000			0.0000
0.0345	0.0021	0.0000		0.0021
0.0095	0.0008	0.0000		0.0008
0.0007	0.0002			0.0002
0.0012	0.0001			0.0001
0.0006	0.0000	0.0000		0.0000
0.0046	0.0004			0.0004
0.0007	0.0001	0.0000		0.0001
0.0001	0.0000	0.0000		0.0000
0.0001	0.0000	0.0000		0.0000
0.0003	0.0000	0.0000		0.0000
0.0019	0.0001	0.0000		0.0001
0.0023	0.0001	0.0000		0.0001
0.0015	0.0001	0.0000		0.0001
0.0066	0.0003	0.0000		0.0003
0.0020	0.0001	0.0000		0.0001
0.0045	0.0002	0.0000		0.0002
0.0125	0.0005	0.0000		0.0006
0.0095	0.0004	0.0000		0.0004
0.0055	0.0003	0.0000		0.0003
0.0001	0.0000	0.0000		0.0000
0.0099	0.0004	0.0000		0.0005
0.0001	0.0000	0.0000		0.0000
0.0001	0.0000	0.0000		0.0000
0.0002	0.0000	0.0000		0.0000
0.0013	0.0001	0.0000		0.0001
0.0001	0.0000	0.0000		0.0000
0.0001	0.0000	0.0000		0.0000
0.0004	0.0001	0.0000		0.0001
0.0007	0.0001	0.0000		0.0001
0.0000	0.0000	0.0000		0.0000
0.0000	0.0000	0.0000		0.0000
0.0000	0.0000	0.0000		0.0000
0.0477	0.0043	0.0003		0.0046
0.0693	0.0050	0.0003		0.0054
0.0223	0.0018	0.0001		0.0020
0.0003	0.0001	0.0000		0.0001
0.0010	0.0002	0.0000		0.0002
0.0012	0.0002	0.0000		0.0003
0.0025	0.0003	0.0000		0.0003
0.0012	0.0005	0.0000		0.0005
0.0020	0.0001	0.0000		0.0001
0.0067	0.0005	0.0000		0.0005
0.0128	0.0009	0.0000		0.0009
0.0415	0.0030	0.0002		0.0032
0.0001	0.0000	0.0000		0.0000
0.0006	0.0001			0.0001
0.3	0.0	0.0	0.0	0.0

EMFAC2011 Category	Population	Total_VMT	cVMT	eVMT	Trips	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_TOTEX	TOG_DIURN	TOG_HTSK	TOG_RUNLS	TOG_TOTAL	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_TOTEX	ROG_DIURN	ROG_HTSK	ROG_RUNLS
All Vehicles	595,927.4	23,495,442.0	20,787,351.7	2,708,090.3	3,099,319.2	0.2464	0.1071	0.4299	0.7834	0.6713	0.1915	0.5565	2.20	0.1708	0.0858	0.3928	0.6494	0.6713	0.1915	0.5565
All Other Buses - Dsl	78.4	3,492.6	3,492.6	0	698.1	0.0002	0.0000		0.0002				0.0002	0.0002	0.0000		0.0002			
All Other Buses - Oth	6.12	257.0	257.0	0	54.5	0.0002	0.0000		0.0003				0.0003	0.0000	0.0000		0.0000			
LDA - Dsl	159.6	5,676.6	5,676.6	0	710.0	0.0000			0.0000				0.0000	0.0000			0.0000			
LDA - Oth	33,716.0	1,268,776.9	0	1,268,776.9	157,397.5				0				0				0			
LDA - Gas	247,491.6	9,738,184.1	9,738,184.1	0	1,142,466.4	0.0504		0.1679	0.2184	0.2784	0.0500	0.2080	0.7548	0.0346		0.1534	0.1880	0.2784	0.0500	0.2080
LDA - Gas	11,628.2	459,645.3	187,624.3	272,021.0	48,082.7	0.0010		0.0099	0.0109	0.0123	0.0022	0.0048	0.0303	0.0007		0.0090	0.0097	0.0123	0.0022	0.0048
LDT1 - Dsl	0.1803	6.83	6.83	0	0.8311	0.0000			0.0000				0.0000	0.0000			0.0000			
LDT1 - Oth	462.7	17,560.3	0	17,560.3	2,167.1				0				0				0			
LDT1 - Gas	16,023.6	576,644.3	576,644.3	0	72,202.7	0.0033		0.0116	0.0148	0.0255	0.0042	0.0187	0.0633	0.0022		0.0106	0.0128	0.0255	0.0042	0.0187
LDT1 - Gas	355.5	13,956.4	5,681.3	8,275.2	1,469.9	0.0000		0.0003	0.0003	0.0003	0.0001	0.0001	0.0008	0.0000		0.0003	0.0003	0.0003	0.0001	0.0001
LDT2 - Dsl	511.0	19,450.0	19,450.0	0	2,356.8	0.0004			0.0004				0.0004	0.0004			0.0004			
LDT2 - Oth	5,287.9	138,678.3	0	138,678.3	24,752.9				0				0				0			
LDT2 - Gas	135,434.0	5,098,704.4	5,098,704.4	0	621,218.0	0.0366		0.1222	0.1588	0.1681	0.0290	0.1256	0.4815	0.0251		0.1116	0.1367	0.1681	0.0290	0.1256
LDT2 - Gas	3,641.8	140,183.4	57,163.9	83,019.5	15,059.0	0.0003		0.0031	0.0034	0.0035	0.0006	0.0013	0.0088	0.0002		0.0028	0.0030	0.0035	0.0006	0.0013
LHD1 - Dsl	3,352.7	105,945.1	105,945.1	0	42,172.8	0.0124	0.0005		0.0129				0.0129	0.0109	0.0004		0.0113			
LHD1 - Oth	5,353.3	224,126.6	0	224,126.6	75,329.4				0				0				0			
LHD1 - Gas	5,107.2	170,954.9	170,954.9	0	76,089.0	0.0011	0.0023	0.0080	0.0114	0.0129	0.0018	0.0174	0.0435	0.0008	0.0016	0.0073	0.0096	0.0129	0.0018	0.0174
LHD2 - Dsl	1,668.5	50,298.3	50,298.3	0	20,987.5	0.0074	0.0002		0.0077				0.0077	0.0065	0.0002		0.0067			
LHD2 - Oth	1,246.0	50,953.2	0	50,953.2	16,488.9				0				0				0			
LHD2 - Gas	537.3	17,715.3	17,715.3	0	8,005.6	0.0001	0.0002	0.0007	0.0010	0.0014	0.0002	0.0019	0.0046	0.0001	0.0001	0.0007	0.0009	0.0014	0.0002	0.0019
MCY - Gas	10,421.7	54,498.3	54,498.3	0	20,843.5	0.0653		0.0231	0.0884	0.0451	0.0822	0.0894	0.3050	0.0522		0.0212	0.0735	0.0451	0.0822	0.0894
MDV - Dsl	902.5	30,866.0	30,866.0	0	4,058.3	0.0003			0.0003				0.0003	0.0002			0.0002			
MDV - Oth	4,903.0	127,093.4	0	127,093.4	22,856.5				0				0				0			
MDV - Gas	80,680.9	2,818,610.7	2,818,610.7	0	365,493.2	0.0220		0.0795	0.1015	0.1187	0.0202	0.0865	0.3269	0.0151		0.0726	0.0877	0.1187	0.0202	0.0865
MDV - Gas	2,329.3	84,551.4	34,494.0	50,057.4	9,631.5	0.0002		0.0020	0.0022	0.0024	0.0004	0.0009	0.0059	0.0001		0.0018	0.0019	0.0024	0.0004	0.0009
MH - Dsl	400.3	3,567.4	3,567.4	0	40.0	0.0004			0.0004				0.0004	0.0003			0.0003			
MH - Gas	602.2	6,213.5	6,213.5	0	60.2	0.0001		0.0000	0.0001	0.0014	0.0002	0.0000	0.0017	0.0001		0.0000	0.0001	0.0014	0.0002	0.0000
Motor Coach - Dsl	19.2	2,437.4	2,437.4	0	441.4	0.0000	0.0001		0.0001				0.0001	0.0000	0.0001		0.0001			
OBUS - Oth	42.5	2,910.5	0	2,910.5	849.5				0				0				0			
OBUS - Gas	69.0	2,432.4	2,432.4	0	1,381.1	0.0001	0.0001	0.0003	0.0004	0.0003	0.0000	0.0003	0.0011	0.0001	0.0001	0.0003	0.0004	0.0003	0.0000	0.0003
PTO-Dsl	0	12,920.8	12,920.8	0		0.0002			0.0002				0.0002	0.0002			0.0002			
PTO-Oth	0	12,863.3	0	12,863.3					0				0				0			
SBUS - Dsl	214.3	4,514.4	4,514.4	0	3,103.7	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001			
SBUS - Oth	28.3	6,844.3	0	6,844.3	3,260.0				0				0				0			
SBUS - Gas	85.4	4,533.1	4,533.1	0	341.5	0.0001	0.0015	0.0002	0.0017	0.0005	0.0001	0.0003	0.0026	0.0000	0.0010	0.0001	0.0012	0.0005	0.0001	0.0003
SBUS-Oth	71.4	1,469.8	1,469.8	0	1,034.2	0.0038	0.0010		0.0048				0.0048	0.0001	0.0000		0.0001			
T6 CAIRP small-Dsl	5.55	399.0	399.0	0	127.5	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 CAIRP small-Oth	7.58	576.8	0	576.8	174.1				0				0				0			
T6 CAIRP small-Dsl	6.82	548.1	548.1	0	156.7	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 CAIRP small-Oth	9.28	790.4	0	790.4	213.3				0				0				0			
T6 CAIRP small-Dsl	31.0	1,426.8	1,426.8	0	711.4	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 CAIRP small-Oth	42.5	2,070.9	0	2,070.9	977.4				0				0				0			
T6 CAIRP heavy-Dsl	82.2	16,629.3	16,629.3	0	1,888.9	0.0001	0.0000		0.0001				0.0001	0.0001	0.0000		0.0001			
T6 CAIRP heavy-Oth	25.3	5,310.3	0	5,310.3	581.1				0				0				0			
T6 instate small-Dsl	167.5	5,523.5	5,523.5	0	2,390.2	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001			
T6 instate small-Oth	177.7	6,267.5	0	6,267.5	2,536.4				0				0				0			
T6 instate small-Dsl	109.1	3,596.5	3,596.5	0	1,556.4	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 instate small-Oth	115.4	4,072.9	0	4,072.9	1,647.0				0				0				0			
T6 instate small-Dsl	473.3	15,604.8	15,604.8	0	6,753.6	0.0001	0.0001		0.0002				0.0002	0.0001	0.0001		0.0002			
T6 instate small-Oth	501.2	17,679.2	0	17,679.2	7,152.3				0				0				0			
T6 instate heavy-Dsl	117.7	5,963.4	5,963.4	0	1,679.3	0.0001	0.0000		0.0001				0.0001	0.0001	0.0000		0.0001			
T6 instate heavy-Oth	71.2	3,826.5	0	3,826.5	1,015.9				0				0				0			
T6 instate heavy-NG	4.21	208.2	208.2	0	60.1	0.0002	0.0001		0.0003				0.0003	0.0000	0.0000		0.0000			
T6 instate small-Dsl	307.9	11,932.8	11,932.8	0	3,559.1	0.0001	0.0001		0.0002				0.0002	0.0001	0.0001		0.0001			
T6 instate small-Oth	325.8	14,272.4	0	14,272.4	3,766.4				0				0				0			
T6 instate small-Dsl	869.1	33,691.0	33,691.0	0	10,046.9	0.0002	0.0002		0.0004				0.0004	0.0002	0.0002		0.0004			
T6 instate small-Oth	918.6	40,295.0	0	40,295.0	10,619.2				0				0				0			
T6 instate small-Dsl	646.6	25,045.8	25,045.8	0	7,475.0	0.0002	0.0001		0.0003				0.0003	0.0002	0.0001		0.0003			
T6 instate small-Oth	682.4	29,906.4	0	29,906.4	7,889.0				0				0				0			
T6 instate heavy-Dsl	521.6	20,691.7	20,691.7	0	6,029.6	0.0002	0.0001		0.0003				0.0003	0.0002	0.0001		0.0003			
T6 instate heavy-Oth	302.4	16,251.1	0	16,251.1	3,496.0				0				0				0			
T6 instate heavy-NG	13.1	514.2	514.2	0	151.3	0.0004	0.0002		0.0006				0.0006	0.0000	0.0000		0.0000			
T6 instate small-Dsl	7.26	325.5	325.5	0	83.9	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 instate small-Oth	7.66	402.1	0	402.1	88.5				0				0				0			
T6 instate heavy-Dsl	856.7	49,559.4	49,559.4	0	9,903.0	0.0004	0.0002		0.0006				0.0006	0.0004	0.0002		0.0005			
T6 instate heavy-Oth	171.4	11,940.7	0	11,940.7	1,981.3				0				0				0			
T6 instate heavy-NG	22.8	1,291.6	1,291.6	0	263.5	0.0010	0.0003		0.0013				0.0013	0.0000	0.0000		0.0000			
T6 OOS small-Dsl	7.64	558.7	558.7	0	175.6	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 OOS small-Dsl	9.40	766.4	766.4	0	215.9	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 OOS small-Dsl	42.6	2,002.6	2,002.6	0	978.8	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 OOS heavy-Dsl	52.4	14,561.5	14,561.5	0	1,204.9	0.0001	0.0000		0.0001				0.0001	0.0001	0.0000		0.0001			
T6 Public-Dsl	15.7	540.6	540.6	0	80.8	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 Public-Oth	14.4	567.5	0	567.5	74.0				0				0				0			
T6 Public-NG	2.10	72.7	72.7	0	10.8	0.0001	0.0000		0.0001				0.0001	0.0000	0.0000		0.0000			
T6 Public-Dsl	44.1	1,512.8	1,512.8	0	226.3	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 Public-Oth	40.2	1,579.2	0	1,579.2	206.2				0				0				0			
T6 Public-NG	6.34	216.6	216.6	0	32.5	0.0002	0.0001		0.0003				0.0003	0.0000	0.0000		0.0000			
T6 Public-Dsl	68.0	2,329.0	2,329.0	0	348.9	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0000			
T6 Public-Oth	61.6	2,408.0	0	2,408.0	315.8				0				0				0			
T6 Public-NG	9.10	314.2	314.2	0	46.7	0.0003	0.0002		0.0005				0.0005	0.0000	0.0000		0.0000			
T6 Public-Dsl	95.4	3,993.0	3,993.0	0	489.6	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001			
T6 Public-Oth	69.1	3,315.5	0	3,315.5	354.4				0				0				0			
T6 Public-NG	13.5	565.0	565.0	0	69.4	0.0006	0.0003		0.0008				0.0008	0.0000	0.0000		0.0000			
T6 Utility-Dsl	14.8	590.5	590.5	0	189.8	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 Utility-Oth	21.1	868.2	0	868.2	270.1				0				0				0			
T6 Utility-NG	0.0335	1.33	1.33	0	0.4284	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 Utility-Dsl	2.80	111.6	111.6	0	35.9	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 Utility-Oth	3.99	164.0	0	164.0	51.0				0				0				0			
T6 Utility-NG	0.0063	0.2519	0.2519	0	0.0810	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 Utility-Dsl	3.11	153.2	153.2	0	39.8	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6 Utility-Oth	4.43	230.4	0	230.4	56.7				0				0				0			
T6 Utility-NG	0.0070	0.3458	0.3458	0	0.0899	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T6TS - Gas	242.7	16,281.2	0	16,281.2	4,856.4				0				0				0			
T6TS - Gas	264.9	13,434.4	13,434.4	0	5,299.3	0.0002	0.0004	0.0012	0.0018	0.0006	0.0001	0.0012	0.0037	0.0002	0.0003	0.0011	0.0015	0.0006	0.0001	0.0012
T7 CAIRP-Dsl	1,764.5	367,975.5	367,975.5	0	40,548.2	0.0053	0.0231		0.0284				0.0284	0.0046	0.0203		0.0249			
T7 CAIRP-Oth	491.4	106,227.1	0	106,227.1	11,291.4				0				0				0			
T7 NNOOS-Dsl	1,955.8	560,653.6	560,653.6	0	44,944.2	0.0078	0.0318		0.0396				0.0396	0.0069	0.0279		0.0348			
T7 NOOS-Dsl	841.7	203,675.5	203,675.5	0	19,342.3	0.0029	0.0137		0.0166				0.0166	0.0026	0.0120		0.0146			
T7 Other Port-Dsl	24.6	5,908.7	5,908.7	0	401.9	0.0001	0.0001		0.0002				0.0002	0.0001	0.0001		0.0002			
T7 Other Port-Oth	5.68	1,495.6	0	1,495.6	92.9				0				0				0			
T7 POAK-Dsl	126.1	14,623.3	14,623.3	0	2,063.1	0.0002	0.0005		0.0007				0.0007	0.0002	0.0005		0.0006			
T7 POAK-Oth	29.4	3,367.1	0	3,367.1	480.5				0				0				0			
T7 POLA-Dsl	115.0	21,336.1	21,336.1	0	1,882.1	0.0003	0.0005		0.0008				0.0008	0.0003	0.0004		0.0007			
T7 POLA-Oth	20.9	3,834.9	0	3,834.9	342.1				0				0				0			
T7 POLA-NG	0.5400	100.1	100.1	0	8.83	0.0001	0.0000		0.0002				0.0002	0.0000	0.0000		0.0000			
T7 Public-Dsl	243.5	9,806.3	9,806.3	0	1,249.2	0.0003	0.0004		0.0007				0.0007	0.0003	0.0003		0.0006			
T7 Public-Oth	169.4	7,979.9	0	7,979.9	869.1				0				0				0			
T7 Public-NG	30.7	1,241.7	1,241.7	0	157.6	0.0024	0.0006		0.0030				0.0030	0.0000	0.0000		0.0000			
T7 SWCV-Dsl	44.7	2,899.9	2,899.9	0	205.6	0.0001	0.0001		0.0002				0.0002	0.0001	0.0001		0.0001			
T7 SWCV-Oth	116.9	7,563.3	0	7,563.3	537.6				0				0				0			
T7 SWCV-NG	118.4	7,671.0	7,671.0	0	544.5	0.0041	0.0004		0.0046				0.0046	0.0001	0.0000		0.0001			
T7 Single-Dsl	53.1	3,502.8	3,502.8	0	499.8	0.0000	0.0001		0.0002				0.0002	0.0000	0.0001		0.0001			
Single Concrete/Transit Mix	68.1	4,859.0	0	4,859.0	641.8				0				0				0			
T7 Single-NG	1.93	127.5	127.5	0	18.2	0.0002	0.0001		0.0002				0.0002	0.0000	0.0000		0.0000			
T7 Single-Dsl	323.3	15,690.9	15,690.9	0	3,045.2	0.0002	0.0008		0.0010				0.0010	0.0002	0.0007		0.0008			
T7 Single Dump-Oth	227.7	14,384.8	0	14,384.8	2,144.7				0				0				0			
T7 Single-NG	11.6	564.5	564.5	0	108.9	0.0007	0.0004		0.0010				0.0010	0.0000	0.0000		0.0000			
T7 Single-Dsl	1,240.1	43,607.9	43,607.9	0	11,681.6	0.0005	0.0029		0.0034				0.0034	0.0005	0.0025		0.0030			
T7 Single Other-Oth	1,038.8	45,538.4	0	45,538.4	9,785.2				0				0				0			
T7 Single-NG	44.7	1,577.9	1,577.9	0	420.8	0.0019	0.0013		0.0032				0.0032	0.0000	0.0000		0.0000			
T7 Tractor-Dsl	4,194.1	272,362.1	272,362.1	0	60,941.0	0.0035	0.0182		0.0217				0.0217	0.0031	0.0160		0.0190			
T7 Tractor-Oth	768.8	55,194.6	0	55,194.6	11,169.9				0				0				0			
T7 Tractor-NG	65.9	4,270.7	4,270.7	0	957.0	0.0049	0.0036		0.0085				0.0085	0.0001	0.0001		0.0001			
T7 Utility-Dsl	15.4	634.9	634.9	0	197.1	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000			
T7 Utility-Oth	10.9	517.9	0	517.9	139.7				0				0				0			
T7IS - Gas	0.3234	52.2	0	52.2	6.47				0				0				0			
T7IS - Gas	0.3705	46.4	46.4	0	7.41	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
UBUS - Dsl	0.2256	8.14	8.14	0	0.9025	0.0000			0.0000				0.0000	0.0000			0.0000			
UBUS - Oth	219.9	14,819.7	0	14,819.7	879.8				0				0				0			
UBUS - Gas	0.0000	0.0026	0.0026	0	0.0001	0		0	0	0	0	0	0	0		0	0	0	0	0
UBUS - NG	0.9089	32.8	32.8	0	3.64	0.0000			0.0000				0.0000	0.0000			0.0000			

EMFAC2011 Category	ROG_TOTAL	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	NOx_RUNEX	NOx_IDLEX	NOx_STREX	NOx_TOTEX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CO2_TOTEX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_TOTEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL
All Vehicles	2.07	13.1	1.31	5.13	19.5	2.81	0.8536	1.11	4.77	7,972.7	167.0	147.5	8,287.3	0.0628	0.0005	0.0022	0.0656	0.2649	0.4307	0.7611
All Other Buses - Dsl	0.0002	0.0007	0.0002		0.0008	0.0044	0.0002	0.0007	0.0052	3.97	0.0465		4.01	0.0000	0.0000		0.0000	0.0000	0.0002	0.0003
All Other Buses - Oth	0.0000	0.0010	0.0001		0.0010	0.0000	0.0000		0.0000	0.2423	0.0074		0.2496	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
LDA - Dsl	0.0000	0.0012			0.0012	0.0001			0.0001	1.13			1.13	0.0000			0.0000	0.0001	0.0001	0.0001
LDA - Oth	0				0				0				0				0	0.0112	0.0061	0.0173
LDA - Gas	0.7244	5.85		2.06	7.91	0.2182		0.2080	0.4263	2,424.0		63.2	2,487.1	0.0059		0.0010	0.0070	0.0859	0.0996	0.1925
LDA - Gas	0.0291	0.1062		0.0694	0.1757	0.0015		0.0060	0.0075	62.3		2.78	65.1	0.0001		0.0000	0.0002	0.0041	0.0022	0.0064
LDT1 - Dsl	0.0000	0.0000			0.0000	0.0000			0.0000	0.0025			0.0025	0.0000			0.0000	0.0000	0.0000	0.0000
LDT1 - Oth	0				0				0				0				0	0.0002	0.0001	0.0002
LDT1 - Gas	0.0612	0.3660		0.1371	0.5031	0.0139		0.0143	0.0282	165.8		4.68	170.4	0.0004		0.0001	0.0005	0.0051	0.0069	0.0125
LDT1 - Gas	0.0008	0.0032		0.0021	0.0053	0.0000		0.0002	0.0002	1.89		0.0978	1.99	0.0000		0.0000	0.0000	0.0001	0.0001	0.0002
LDT2 - Dsl	0.0004	0.0041			0.0041	0.0007			0.0007	5.37			5.37	0.0001			0.0001	0.0002	0.0002	0.0005
LDT2 - Oth	0				0				0				0				0	0.0012	0.0007	0.0019
LDT2 - Gas	0.4594	3.58		1.44	5.01	0.1302		0.1416	0.2719	1,520.4		42.0	1,562.4	0.0032		0.0006	0.0038	0.0450	0.0609	0.1096
LDT2 - Gas	0.0085	0.0324		0.0217	0.0541	0.0005		0.0019	0.0023	19.0		1.06	20.0	0.0000		0.0000	0.0000	0.0012	0.0007	0.0019
LHD1 - Dsl	0.0113	0.0283	0.0034		0.0317	0.0389	0.0041		0.0431	69.9	0.4324		70.3	0.0024	0.0001		0.0025	0.0014	0.0091	0.0130
LHD1 - Oth	0				0				0				0				0	0.0020	0.0096	0.0116
LHD1 - Gas	0.0417	0.1123	0.0213	0.2738	0.4073	0.0036	0.0001	0.0342	0.0379	139.4	0.5592	1.51	141.5	0.0002		0.0000	0.0002	0.0015	0.0147	0.0165
LHD2 - Dsl	0.0067	0.0172	0.0017		0.0189	0.0270	0.0022		0.0292	38.9	0.3521		39.2	0.0015	0.0001		0.0015	0.0007	0.0050	0.0072
LHD2 - Oth	0				0				0				0				0	0.0004	0.0026	0.0030
LHD2 - Gas	0.0044	0.0118	0.0022	0.0293	0.0433	0.0004	0.0000	0.0031	0.0036	16.3	0.0686	0.1552	16.5	0.0000		0.0000	0.0000	0.0002	0.0018	0.0020
MCY - Gas	0.2901	0.6385		0.1774	0.8159	0.0287		0.0016	0.0303	10.0		0.4980	10.5	0.0001		0.0001	0.0002	0.0002	0.0007	0.0012
MDV - Dsl	0.0002	0.0071			0.0071	0.0005			0.0005	11.1			11.1	0.0000			0.0000	0.0003	0.0004	0.0007
MDV - Oth	0				0				0				0				0	0.0011	0.0006	0.0017
MDV - Gas	0.3131	2.07		0.8792	2.95	0.0793		0.0912	0.1705	1,020.3		30.6	1,050.9	0.0018		0.0004	0.0022	0.0249	0.0342	0.0612
MDV - Gas	0.0056	0.0195		0.0139	0.0334	0.0003		0.0012	0.0015	11.5		0.8283	12.3	0.0000		0.0000	0.0000	0.0007	0.0004	0.0012
MH - Dsl	0.0003	0.0010			0.0010	0.0102			0.0102	4.25			4.25	0.0001			0.0001	0.0001	0.0002	0.0004
MH - Gas	0.0017	0.0011		0.0002	0.0013	0.0014		0.0000	0.0015	13.2		0.0017	13.2	0.0000		0.0000	0.0000	0.0001	0.0003	0.0004
Motor Coach - Dsl	0.0001	0.0001	0.0012		0.0013	0.0025	0.0004	0.0005	0.0034	4.08	0.1751		4.25	0.0001	0.0000		0.0001	0.0000	0.0002	0.0003
OBUS - Oth	0				0				0				0				0	0.0000	0.0001	0.0001
OBUS - Gas	0.0010	0.0011	0.0004	0.0047	0.0063	0.0008	0.0000	0.0006	0.0013	4.08	0.0253	0.0340	4.13	0.0000		0.0000	0.0000	0.0000	0.0001	0.0002
PTO-Dsl	0.0002	0.0025			0.0025	0.0354			0.0354	24.5			24.5	0.0001			0.0001			0.0001
PTO-Oth	0				0				0				0				0			0
SBUS - Dsl	0.0001	0.0003	0.0017		0.0019	0.0018	0.0014	0.0020	0.0053	5.10	0.4343		5.54	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003
SBUS - Oth	0				0				0				0				0	0.0001	0.0002	0.0003
SBUS - Gas	0.0021	0.0010	0.0077	0.0031	0.0118	0.0008	0.0001	0.0003	0.0012	3.72	0.2090	0.0139	3.94	0.0000		0.0000	0.0000	0.0000	0.0002	0.0003
SBUS-Oth	0.0001	0.0103	0.0027		0.0130	0.0003	0.0004		0.0007	1.64	0.3191		1.95	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 CAIRP small-Dsl	0.0000	0.0000	0.0000		0.0000	0.0001	0.0000	0.0000	0.0001	0.4427	0.0031		0.4458	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 CAIRP small-Oth	0				0				0				0				0	0.0000	0.0000	0.0000
T6 CAIRP small-Dsl	0.0000	0.0000	0.0000		0.0000	0.0001	0.0000	0.0001	0.0002	0.6083	0.0038		0.6122	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 CAIRP small-Oth	0				0				0				0				0	0.0000	0.0000	0.0000
T6 CAIRP small-Dsl	0.0000	0.0000	0.0001		0.0001	0.0003	0.0001	0.0003	0.0006	1.58	0.0173		1.60	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 CAIRP small-Oth	0				0				0				0				0	0.0000	0.0000	0.0001
T6 CAIRP heavy-Dsl	0.0001	0.0005	0.0002		0.0007	0.0035	0.0002	0.0008	0.0045	16.3	0.0451		16.3	0.0001	0.0000		0.0001	0.0002	0.0008	0.0011
T6 CAIRP heavy-Oth	0				0				0				0				0	0.0001	0.0001	0.0002
T6 instate small-Dsl	0.0001	0.0003	0.0013		0.0016	0.0022	0.0011	0.0027	0.0059	6.31	0.3214		6.63	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004
T6 instate small-Oth	0				0				0				0				0	0.0001	0.0002	0.0002
T6 instate small-Dsl	0.0000	0.0002	0.0008		0.0011	0.0014	0.0007	0.0018	0.0039	4.11	0.2093		4.32	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002
T6 instate small-Oth	0				0				0				0				0	0.0001	0.0001	0.0002
T6 instate small-Dsl	0.0002	0.0009	0.0037		0.0046	0.0061	0.0030	0.0077	0.0168	17.8	0.9082		18.7	0.0000	0.0000		0.0000	0.0002	0.0008	0.0011
T6 instate small-Oth	0				0				0				0				0	0.0002	0.0005	0.0007
T6 instate heavy-Dsl	0.0001	0.0004	0.0009		0.0014	0.0037	0.0010	0.0024	0.0070	6.99	0.2359		7.23	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004
T6 instate heavy-Oth	0				0				0				0				0	0.0001	0.0001	0.0002
T6 instate heavy-NG	0.0000	0.0009	0.0002		0.0010	0.0000	0.0000		0.0000	0.2284	0.0197		0.2481	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 instate small-Dsl	0.0001	0.0006	0.0026		0.0031	0.0035	0.0021	0.0046	0.0101	13.2	0.6354		13.8	0.0000	0.0000		0.0000	0.0002	0.0006	0.0008
T6 instate small-Oth	0				0				0				0				0	0.0002	0.0004	0.0005
T6 instate small-Dsl	0.0004	0.0016	0.0073		0.0088	0.0099	0.0059	0.0130	0.0287	37.3	1.79		39.1	0.0001	0.0000		0.0001	0.0004	0.0017	0.0022
T6 instate small-Oth	0				0				0				0				0	0.0005	0.0010	0.0015
T6 instate small-Dsl	0.0003	0.0012	0.0054		0.0066	0.0074	0.0044	0.0097	0.0215	27.7	1.33		29.1	0.0001	0.0000		0.0001	0.0003	0.0012	0.0017
T6 instate small-Oth	0				0				0				0				0	0.0004	0.0007	0.0011
T6 instate heavy-Dsl	0.0003	0.0012	0.0043		0.0055	0.0103	0.0046	0.0098	0.0247	23.1	1.13		24.2	0.0001	0.0000		0.0001	0.0003	0.0010	0.0014
T6 instate heavy-Oth	0				0				0				0				0	0.0002	0.0004	0.0006
T6 instate heavy-NG	0.0000	0.0015	0.0006		0.0021	0.0000	0.0001		0.0001	0.4785	0.0645		0.5429	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 instate small-Dsl	0.0000	0.0000	0.0001		0.0001	0.0001	0.0000	0.0001	0.0003	0.3603	0.0150		0.3752	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 instate small-Oth	0				0				0				0				0	0.0000	0.0000	0.0000
T6 instate heavy-Dsl	0.0005	0.0027	0.0071		0.0098	0.0207	0.0072	0.0152	0.0430	50.5	1.81		52.3	0.0002	0.0000		0.0002	0.0007	0.0025	0.0033
T6 instate heavy-Oth	0				0				0				0				0	0.0002	0.0003	0.0005
T6 instate heavy-NG	0.0000	0.0038	0.0010		0.0048	0.0001	0.0001		0.0002	1.18	0.1101		1.29	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 OOS small-Dsl	0.0000	0.0000	0.0000		0.0000	0.0001	0.0000	0.0001	0.0003	0.5819	0.0040		0.5860	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 OOS small-Dsl	0.0000	0.0000	0.0000		0.0000	0.0002	0.0000	0.0001	0.0004	0.7988	0.0050		0.8038	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001
T6 OOS small-Dsl	0.0000	0.0001	0.0001		0.0002	0.0005	0.0001	0.0006	0.0013	2.08	0.0224		2.11	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 OOS heavy-Dsl	0.0001	0.0005	0.0001		0.0006	0.0037	0.0002	0.0008	0.0047	13.6	0.0275		13.7	0.0001	0.0000		0.0001	0.0002	0.0007	0.0010
T6 Public-Dsl	0.0000	0.0000	0.0002		0.0002	0.0004	0.0002	0.0001	0.0007	0.6427	0.0479		0.6905	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Public-Oth	0				0				0				0				0	0.0000	0.0000	0.0000
T6 Public-NG	0.0000	0.0002	0.0001		0.0004	0.0000	0.0000		0.0000	0.0736	0.0144		0.0880	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Public-Dsl	0.0000	0.0001	0.0005		0.0006	0.0009	0.0006	0.0003	0.0018	1.80	0.1354		1.94	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 Public-Oth	0				0				0				0				0	0.0000	0.0000	0.0001
T6 Public-NG	0.0000	0.0007	0.0004		0.0011	0.0000	0.0001		0.0001	0.2204	0.0428		0.2632	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Public-Dsl	0.0000	0.0001	0.0008		0.0009	0.0011	0.0008	0.0005	0.0025	2.77	0.2068		2.97	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002
T6 Public-Oth	0				0				0				0				0	0.0000	0.0001	0.0001
T6 Public-NG	0.0000	0.0011	0.0006		0.0016	0.0000	0.0001		0.0001	0.3192	0.0627		0.3819	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Public-Dsl	0.0001	0.0002	0.0011		0.0014	0.0017	0.0012	0.0008	0.0037	4.69	0.2842		4.97	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003
T6 Public-Oth	0				0				0				0				0	0.0000	0.0001	0.0001
T6 Public-NG	0.0000	0.0019	0.0008		0.0028	0.0000	0.0001		0.0002	0.5742	0.0930		0.6672	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Dsl	0.0000	0.0000	0.0001		0.0001	0.0001	0.0001	0.0002	0.0004	0.6565	0.0228		0.6793	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Oth	0				0				0				0				0	0.0000	0.0000	0.0000
T6 Utility-NG	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000	0.0013	0.0001		0.0014	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Dsl	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.1241	0.0043		0.1284	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Oth	0				0				0				0				0	0.0000	0.0000	0.0000
T6 Utility-NG	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000	0.0002	0.0000		0.0003	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Dsl	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.1704	0.0048		0.1752	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Oth	0				0				0				0				0	0.0000	0.0000	0.0000
T6 Utility-NG	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000	0.0003	0.0000		0.0004	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6TS - Gas	0				0				0				0				0	0.0002	0.0004	0.0006
T6TS - Gas	0.0034	0.0027	0.0045	0.0201	0.0272	0.0010	0.0000	0.0022	0.0032	22.6	0.1249	0.1792	22.9	0.0000		0.0000	0.0000	0.0002	0.0007	0.0009
T7 CAIRP-Dsl	0.0249	0.0157	0.2999		0.3155	0.4877	0.1555	0.0703	0.7135	514.6	38.8		553.4	0.0120	0.0001		0.0121	0.0146	0.0332	0.0599
T7 CAIRP-Oth	0				0				0				0				0	0.0042	0.0048	0.0090
T7 NNOOS-Dsl	0.0348	0.0232	0.4125		0.4357	0.8213	0.3299	0.1177	1.27	750.6	51.1		801.7	0.0181	0.0001		0.0182	0.0222	0.0506	0.0910
T7 NOOS-Dsl	0.0146	0.0087	0.1775		0.1862	0.3069	0.1420	0.0507	0.4995	272.6	22.0		294.5	0.0069	0.0001		0.0070	0.0081	0.0184	0.0335
T7 Other Port-Dsl	0.0002	0.0004	0.0014		0.0018	0.0081	0.0008	0.0008	0.0096	8.86	0.1754		9.04	0.0001	0.0000		0.0001	0.0002	0.0006	0.0010
T7 Other Port-Oth	0				0				0				0				0	0.0001	0.0001	0.0001
T7 POAK-Dsl	0.0006	0.0010	0.0070		0.0081	0.0207	0.0040	0.0041	0.0288	21.9	0.9005		22.8	0.0003	0.0000		0.0003	0.0006	0.0015	0.0024
T7 POAK-Oth	0				0				0				0				0	0.0001	0.0002	0.0003
T7 POLA-Dsl	0.0007	0.0016	0.0064		0.0080	0.0327	0.0039	0.0040	0.0406	32.3	0.8327		33.1	0.0004	0.0000		0.0004	0.0008	0.0022	0.0035
T7 POLA-Oth	0				0				0				0				0	0.0002	0.0002	0.0004
T7 POLA-NG	0.0000	0.0005	0.0001		0.0006	0.0000	0.0000		0.0000	0.1195	0.0088		0.1283	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T7 Public-Dsl	0.0006	0.0016	0.0045		0.0061	0.0193	0.0034	0.0072	0.0299	17.2	0.6836		17.9	0.0001	0.0000		0.0001	0.0004	0.0012	0.0017
T7 Public-Oth	0				0				0				0				0	0.0003	0.0005	0.0008
T7 Public-NG	0.0000	0.0111	0.0018		0.0129	0.0004	0.0003		0.0006	1.87	0.1828		2.06	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002
T7 SWCV-Dsl	0.0001	0.0002	0.0009		0.0011	0.0062	0.0009	0.0010	0.0082	10.8	0.1508		10.9	0.0001	0.0000		0.0001	0.0001	0.0007	0.0008
T7 SWCV-Oth	0				0				0				0				0	0.0003	0.0009	0.0012
T7 SWCV-NG	0.0001	0.0852	0.0047		0.0900	0.0028	0.0001		0.0029	10.5	0.7750		11.3	0.0000	0.0000		0.0000	0.0003	0.0018	0.0021
T7 Single-Dsl	0.0001	0.0002	0.0016		0.0018	0.0031	0.0008	0.0013	0.0052	5.54	0.2128		5.76	0.0001	0.0000		0.0001	0.0001	0.0003	0.0005
Single Concrete/Transit Mix	0				0				0				0				0	0.0002	0.0002	0.0004
T7 Single-NG	0.0000	0.0006	0.0002		0.0008	0.0000	0.0000		0.0000	0.1485	0.0176		0.1661	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T7 Single-Dsl	0.0008	0.0009	0.0098		0.0107	0.0187	0.0053	0.0088	0.0327	25.5	1.38		26.9	0.0003	0.0000		0.0003	0.0006	0.0015	0.0024
T7 Single Dump-Oth	0				0				0				0				0	0.0006	0.0007	0.0013
T7 Single-NG	0.0000	0.0028	0.0010		0.0038	0.0001	0.0001		0.0003	0.6724	0.1067		0.7792	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T7 Single-Dsl	0.0030	0.0023	0.0376		0.0399	0.0471	0.0198	0.0331	0.1000	70.0	5.12		75.1	0.0008	0.0000		0.0008	0.0017	0.0042	0.0067
T7 Single Other-Oth	0				0				0				0				0	0.0018	0.0022	0.0040
T7 Single-NG	0.0000	0.0073	0.0041		0.0114	0.0003	0.0006		0.0009	1.85	0.4094		2.26	0.0000	0.0000		0.0000	0.0001	0.0002	0.0002
T7 Tractor-Dsl	0.0190	0.0144	0.2361		0.2504	0.3537	0.1419	0.2253	0.7210	379.7	30.7		410.4	0.0065	0.0001		0.0066	0.0108	0.0258	0.0432
T7 Tractor-Oth	0				0				0				0				0	0.0022	0.0026	0.0048
T7 Tractor-NG	0.0001	0.0177	0.0114		0.0291	0.0008	0.0015		0.0023	4.76	1.09		5.85	0.0000	0.0000		0.0000	0.0002	0.0004	0.0006
T7 Utility-Dsl	0.0000	0.0001	0.0002		0.0002	0.0007	0.0001	0.0009	0.0017	1.07	0.0225		1.09	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T7 Utility-Oth	0				0				0				0				0	0.0000	0.0000	0.0001
T7IS - Gas	0				0				0				0				0	0.0000	0.0000	0.0000
T7IS - Gas	0.0000	0.0015		0.0000	0.0016	0.0001		0.0000	0.0001	0.0890		0.0003	0.0892	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
UBUS - Dsl	0.0000	0.0000			0.0000	0.0000			0.0000	0.0059			0.0059	0.0000			0.0000	0.0000	0.0000	0.0000
UBUS - Oth	0				0				0				0				0	0.0004	0.0009	0.0013
UBUS - Gas	0	0.0000		0.0000	0.0000	0		0	0	0.0000		0.0000	0.0000	0		0	0	0	0.0000	0.0000
UBUS - NG	0.0000	0.0000			0.0000	0.0000			0.0000	0.0271			0.0271	0.0000			0.0000	0.0000	0.0000	0.0000

PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_TOTEX	PM2_5_PMTW	PM2_5_PMBW	PM2_5_TOTAL	SOx_RUNEX	SOx_IDLEX	SOx_STREX	SOx_TOTEX	Fuel_GAS	Fuel_DSL	Fuel_NG
0.0597	0.0005	0.0020	0.0622	0.0662	0.1507	0.2792	0.0784	0.0016	0.0016	0.0816	597.6	240.8	3.48
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3612	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0307
0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.1021	
			0	0.0028	0.0022	0.0049				0			
0.0055		0.0010	0.0064	0.0215	0.0349	0.0628	0.0243		0.0007	0.0250	298.2		
0.0001		0.0000	0.0001	0.0010	0.0008	0.0019	0.0006		0.0000	0.0007	6.97		
0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0022	
			0	0.0000	0.0000	0.0001				0			
0.0003		0.0001	0.0004	0.0013	0.0024	0.0041	0.0017		0.0000	0.0017	18.2		
0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000		0.0000	0.0000	0.2124		
0.0001			0.0001	0.0000	0.0001	0.0002	0.0001			0.0001		0.4836	
			0	0.0003	0.0002	0.0005				0			
0.0029		0.0005	0.0035	0.0112	0.0213	0.0360	0.0152		0.0004	0.0157	167.2		
0.0000		0.0000	0.0000	0.0003	0.0002	0.0006	0.0002		0.0000	0.0002	2.14		
0.0023	0.0001		0.0024	0.0004	0.0032	0.0059	0.0007	0.0000		0.0007		6.33	
			0	0.0005	0.0034	0.0039				0			
0.0002		0.0000	0.0002	0.0004	0.0051	0.0057	0.0014	0.0000	0.0000	0.0014	15.1		
0.0014	0.0000		0.0014	0.0002	0.0018	0.0034	0.0004	0.0000		0.0004		3.53	
			0	0.0001	0.0009	0.0010				0			
0.0000		0.0000	0.0000	0.0000	0.0006	0.0007	0.0002	0.0000	0.0000	0.0002	1.76		
0.0001		0.0001	0.0002	0.0001	0.0003	0.0005	0.0001		0.0000	0.0001	1.28		
0.0000			0.0000	0.0001	0.0001	0.0002	0.0001			0.0001		1.00	
			0	0.0003	0.0002	0.0005				0			
0.0017		0.0003	0.0020	0.0062	0.0120	0.0202	0.0102		0.0003	0.0105	112.4		
0.0000		0.0000	0.0000	0.0002	0.0001	0.0004	0.0001		0.0000	0.0001	1.31		
0.0001			0.0001	0.0000	0.0001	0.0002	0.0000			0.0000		0.3826	
0.0000		0.0000	0.0000	0.0000	0.0001	0.0001	0.0001		0.0000	0.0001	1.41		
0.0001	0.0000		0.0001	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3827	
			0	0.0000	0.0000	0.0000				0			
0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.4414		
0.0001			0.0001			0.0001	0.0002			0.0002		2.21	
			0			0				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0001		0.4982	
			0	0.0000	0.0001	0.0001				0			
0.0000		0.0000	0.0000	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.4220		
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.2404
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0401	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0551	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1439	
			0	0.0000	0.0000	0.0000				0			
0.0001	0.0000		0.0001	0.0001	0.0003	0.0004	0.0002	0.0000		0.0002		1.47	
			0	0.0000	0.0000	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.5968	
			0	0.0000	0.0001	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3890	
			0	0.0000	0.0000	0.0001				0			
0.0000	0.0000		0.0000	0.0001	0.0003	0.0004	0.0002	0.0000		0.0002		1.69	
			0	0.0001	0.0002	0.0002				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.6505	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0305
0.0000	0.0000		0.0000	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		1.25	
			0	0.0000	0.0001	0.0002				0			
0.0001	0.0000		0.0001	0.0001	0.0006	0.0008	0.0004	0.0000		0.0004		3.52	
			0	0.0001	0.0003	0.0005				0			
0.0001	0.0000		0.0001	0.0001	0.0004	0.0006	0.0003	0.0000		0.0003		2.61	
			0	0.0001	0.0003	0.0004				0			
0.0001	0.0000		0.0001	0.0001	0.0004	0.0005	0.0002	0.0000		0.0002		2.18	
			0	0.0001	0.0001	0.0002				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0668
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0338	
			0	0.0000	0.0000	0.0000				0			
0.0002	0.0000		0.0002	0.0002	0.0009	0.0012	0.0005	0.0000		0.0005		4.71	
			0	0.0000	0.0001	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.1587
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0527	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0723	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.1895	
0.0001	0.0000		0.0001	0.0000	0.0002	0.0004	0.0001	0.0000		0.0001		1.23	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0621	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0108
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1746	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0324
0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2676	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0470
0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.4473	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0821
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0611	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0002
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0116	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0000
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0158	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0000
			0	0.0001	0.0001	0.0002				0			
0.0000		0.0000	0.0000	0.0000	0.0002	0.0003	0.0002	0.0000	0.0000	0.0002	2.44		
0.0115	0.0001		0.0116	0.0037	0.0116	0.0268	0.0049	0.0004		0.0053		49.8	
			0	0.0011	0.0017	0.0027				0			
0.0173	0.0001		0.0174	0.0098	0.0177	0.0467	0.0072	0.0005		0.0076		72.2	
0.0066	0.0000		0.0067	0.0020	0.0064	0.0152	0.0026	0.0002		0.0028		26.5	
0.0001	0.0000		0.0001	0.0001	0.0002	0.0004	0.0001	0.0000		0.0001		0.8136	
			0	0.0000	0.0000	0.0000				0			
0.0003	0.0000		0.0003	0.0001	0.0005	0.0009	0.0002	0.0000		0.0002		2.05	
			0	0.0000	0.0001	0.0001				0			
0.0004	0.0000		0.0004	0.0002	0.0008	0.0014	0.0003	0.0000		0.0003		2.98	
			0	0.0000	0.0001	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0158
0.0001	0.0000		0.0001	0.0001	0.0004	0.0006	0.0002	0.0000		0.0002		1.61	
			0	0.0001	0.0002	0.0002				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001				0			0.2531
0.0001	0.0000		0.0001	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		0.9845	
			0	0.0001	0.0003	0.0004				0			
0.0000	0.0000		0.0000	0.0001	0.0006	0.0007				0			1.36
0.0001	0.0000		0.0001	0.0000	0.0001	0.0002	0.0001	0.0000		0.0001		0.5182	
			0	0.0000	0.0001	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0204
0.0003	0.0000		0.0003	0.0002	0.0005	0.0010	0.0002	0.0000		0.0003		2.42	
			0	0.0001	0.0002	0.0004				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0958
0.0007	0.0000		0.0008	0.0004	0.0015	0.0027	0.0007	0.0000		0.0007		6.76	
			0	0.0005	0.0008	0.0012				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001				0			0.2781
0.0062	0.0001		0.0063	0.0027	0.0090	0.0180	0.0036	0.0003		0.0039		36.9	
			0	0.0005	0.0009	0.0015				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0002				0			0.7196
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0983	
			0	0.0000	0.0000	0.0000				0			
			0	0.0000	0.0000	0.0000				0			
0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0098		
0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0005	
			0	0.0001	0.0003	0.0004				0			
0		0	0	0	0	0.0000	0		0	0	0.0000		
0.0000			0.0000	0.0000	0.0000	0.0000				0			0.0033

Veh_Tech	EMFAC2011 Category	Population	Total_VMT	cVMT	eVMT	Trips	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_TOTEX	TOG_DIURN	TOG_HTSK	TOG_RUNLS
All Other Buses-Dsl	All Other Buses - Dsl	78.4	3,492.6	3,492.6	0	698.1	0.0002	0.0000		0.0002			
LDA-Dsl	LDA - Dsl	159.6	5,676.6	5,676.6	0	710.0	0.0000			0.0000			
LDT1-Dsl	LDT1 - Dsl	0.1803	6.83	6.83	0	0.8311	0.0000			0.0000			
LDT2-Dsl	LDT2 - Dsl	511.0	19,450.0	19,450.0	0	2,356.8	0.0004			0.0004			
LHD1-Dsl	LHD1 - Dsl	3,352.7	105,945.1	105,945.1	0	42,172.8	0.0124	0.0005		0.0129			
LHD2-Dsl	LHD2 - Dsl	1,668.5	50,298.3	50,298.3	0	20,987.5	0.0074	0.0002		0.0077			
MDV-Dsl	MDV - Dsl	902.5	30,866.0	30,866.0	0	4,058.3	0.0003			0.0003			
MH-Dsl	MH - Dsl	400.3	3,567.4	3,567.4	0	40.0	0.0004			0.0004			
Motor Coach-Dsl	Motor Coach - Dsl	19.2	2,437.4	2,437.4	0	441.4	0.0000	0.0001		0.0001			
PTO-Dsl	PTO-Dsl	0	12,920.8	12,920.8	0		0.0002			0.0002			
SBUS-Dsl	SBUS - Dsl	214.3	4,514.4	4,514.4	0	3,103.7	0.0000	0.0000		0.0001			
T6 CAIRP Class 4-Dsl	T6 CAIRP small-Dsl	5.55	399.0	399.0	0	127.5	0.0000	0.0000		0.0000			
T6 CAIRP Class 5-Dsl	T6 CAIRP small-Dsl	6.82	548.1	548.1	0	156.7	0.0000	0.0000		0.0000			
T6 CAIRP Class 6-Dsl	T6 CAIRP small-Dsl	31.0	1,426.8	1,426.8	0	711.4	0.0000	0.0000		0.0000			
T6 CAIRP Class 7-Dsl	T6 CAIRP heavy-Dsl	82.2	16,629.3	16,629.3	0	1,888.9	0.0001	0.0000		0.0001			
T6 Instate Delivery Class 4-Dsl	T6 instate small-Dsl	167.5	5,523.5	5,523.5	0	2,390.2	0.0000	0.0000		0.0001			
T6 Instate Delivery Class 5-Dsl	T6 instate small-Dsl	109.1	3,596.5	3,596.5	0	1,556.4	0.0000	0.0000		0.0000			
T6 Instate Delivery Class 6-Dsl	T6 instate small-Dsl	473.3	15,604.8	15,604.8	0	6,753.6	0.0001	0.0001		0.0002			
T6 Instate Delivery Class 7-Dsl	T6 instate heavy-Dsl	117.7	5,963.4	5,963.4	0	1,679.3	0.0001	0.0000		0.0001			
T6 Instate Other Class 4-Dsl	T6 instate small-Dsl	307.9	11,932.8	11,932.8	0	3,559.1	0.0001	0.0001		0.0002			
T6 Instate Other Class 5-Dsl	T6 instate small-Dsl	869.1	33,691.0	33,691.0	0	10,046.9	0.0002	0.0002		0.0004			
T6 Instate Other Class 6-Dsl	T6 instate small-Dsl	646.6	25,045.8	25,045.8	0	7,475.0	0.0002	0.0001		0.0003			
T6 Instate Other Class 7-Dsl	T6 instate heavy-Dsl	521.6	20,691.7	20,691.7	0	6,029.6	0.0002	0.0001		0.0003			
T6 Instate Tractor Class 6-Dsl	T6 instate small-Dsl	7.26	325.5	325.5	0	83.9	0.0000	0.0000		0.0000			
T6 Instate Tractor Class 7-Dsl	T6 instate heavy-Dsl	856.7	49,559.4	49,559.4	0	9,903.0	0.0004	0.0002		0.0006			
T6 OOS Class 4-Dsl	T6 OOS small-Dsl	7.64	558.7	558.7	0	175.6	0.0000	0.0000		0.0000			
T6 OOS Class 5-Dsl	T6 OOS small-Dsl	9.40	766.4	766.4	0	215.9	0.0000	0.0000		0.0000			
T6 OOS Class 6-Dsl	T6 OOS small-Dsl	42.6	2,002.6	2,002.6	0	978.8	0.0000	0.0000		0.0000			
T6 OOS Class 7-Dsl	T6 OOS heavy-Dsl	52.4	14,561.5	14,561.5	0	1,204.9	0.0001	0.0000		0.0001			
T6 Public Class 4-Dsl	T6 Public-Dsl	15.7	540.6	540.6	0	80.8	0.0000	0.0000		0.0000			
T6 Public Class 5-Dsl	T6 Public-Dsl	44.1	1,512.8	1,512.8	0	226.3	0.0000	0.0000		0.0000			
T6 Public Class 6-Dsl	T6 Public-Dsl	68.0	2,329.0	2,329.0	0	348.9	0.0000	0.0000		0.0001			
T6 Public Class 7-Dsl	T6 Public-Dsl	95.4	3,993.0	3,993.0	0	489.6	0.0000	0.0000		0.0001			
T6 Utility Class 5-Dsl	T6 Utility-Dsl	14.8	590.5	590.5	0	189.8	0.0000	0.0000		0.0000			
T6 Utility Class 6-Dsl	T6 Utility-Dsl	2.80	111.6	111.6	0	35.9	0.0000	0.0000		0.0000			
T6 Utility Class 7-Dsl	T6 Utility-Dsl	3.11	153.2	153.2	0	39.8	0.0000	0.0000		0.0000			
T7 CAIRP Class 8-Dsl	T7 CAIRP-Dsl	1,764.5	367,975.5	367,975.5	0	40,548.2	0.0053	0.0231		0.0284			
T7 NNOOS Class 8-Dsl	T7 NNOOS-Dsl	1,955.8	560,653.6	560,653.6	0	44,944.2	0.0078	0.0318		0.0396			
T7 NOOS Class 8-Dsl	T7 NOOS-Dsl	841.7	203,675.5	203,675.5	0	19,342.3	0.0029	0.0137		0.0166			
T7 Other Port Class 8-Dsl	T7 Other Port-Dsl	24.6	5,908.7	5,908.7	0	401.9	0.0001	0.0001		0.0002			
T7 POAK Class 8-Dsl	T7 POAK-Dsl	126.1	14,623.3	14,623.3	0	2,063.1	0.0002	0.0005		0.0007			
T7 POLA Class 8-Dsl	T7 POLA-Dsl	115.0	21,336.1	21,336.1	0	1,882.1	0.0003	0.0005		0.0008			
T7 Public Class 8-Dsl	T7 Public-Dsl	243.5	9,806.3	9,806.3	0	1,249.2	0.0003	0.0004		0.0007			
T7 SWCV Class 8-Dsl	T7 SWCV-Dsl	44.7	2,899.9	2,899.9	0	205.6	0.0001	0.0001		0.0002			
T7 Single Concrete/Transit Mix Class 8-Dsl	T7 Single-Dsl	53.1	3,502.8	3,502.8	0	499.8	0.0000	0.0001		0.0002			
T7 Single Dump Class 8-Dsl	T7 Single-Dsl	323.3	15,690.9	15,690.9	0	3,045.2	0.0002	0.0008		0.0010			
T7 Single Other Class 8-Dsl	T7 Single-Dsl	1,240.1	43,607.9	43,607.9	0	11,681.6	0.0005	0.0029		0.0034			
T7 Tractor Class 8-Dsl	T7 Tractor-Dsl	4,194.1	272,362.1	272,362.1	0	60,941.0	0.0035	0.0182		0.0217			
T7 Utility Class 8-Dsl	T7 Utility-Dsl	15.4	634.9	634.9	0	197.1	0.0000	0.0000		0.0000			
UBUS-Dsl	UBUS - Dsl	0.2256	8.14	8.14	0	0.9025	0.0000			0.0000			
	TOTALs	22,807.2	1,979,918.7	1,979,918.7	0.0	317,919.5	0.0	0.1	0.0	0.1	0.0	0.0	0.0

TOG_TOTAL	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_TOTEX	ROG_DIURN	ROG_HTSK	ROG_RUNLS	ROG_TOTAL	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	NOx_RUNEX	NOx_IDLEX	NOx_STREX
0.0002	0.0002	0.0000		0.0002				0.0002	0.0007	0.0002		0.0008	0.0044	0.0002	0.0007
0.0000	0.0000			0.0000				0.0000	0.0012			0.0012	0.0001		
0.0000	0.0000			0.0000				0.0000	0.0000			0.0000	0.0000		
0.0004	0.0004			0.0004				0.0004	0.0041			0.0041	0.0007		
0.0129	0.0109	0.0004		0.0113				0.0113	0.0283	0.0034		0.0317	0.0389	0.0041	
0.0077	0.0065	0.0002		0.0067				0.0067	0.0172	0.0017		0.0189	0.0270	0.0022	
0.0003	0.0002			0.0002				0.0002	0.0071			0.0071	0.0005		
0.0004	0.0003			0.0003				0.0003	0.0010			0.0010	0.0102		
0.0001	0.0000	0.0001		0.0001				0.0001	0.0001	0.0012		0.0013	0.0025	0.0004	0.0005
0.0002	0.0002			0.0002				0.0002	0.0025			0.0025	0.0354		
0.0001	0.0000	0.0000		0.0001				0.0001	0.0003	0.0017		0.0019	0.0018	0.0014	0.0020
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0001	0.0000	0.0000
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0001	0.0000	0.0001
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0003	0.0001	0.0003
0.0001	0.0001	0.0000		0.0001				0.0001	0.0005	0.0002		0.0007	0.0035	0.0002	0.0008
0.0001	0.0000	0.0000		0.0001				0.0001	0.0003	0.0013		0.0016	0.0022	0.0011	0.0027
0.0000	0.0000	0.0000		0.0000				0.0000	0.0002	0.0008		0.0011	0.0014	0.0007	0.0018
0.0002	0.0001	0.0001		0.0002				0.0002	0.0009	0.0037		0.0046	0.0061	0.0030	0.0077
0.0001	0.0001	0.0000		0.0001				0.0001	0.0004	0.0009		0.0014	0.0037	0.0010	0.0024
0.0002	0.0001	0.0001		0.0001				0.0001	0.0006	0.0026		0.0031	0.0035	0.0021	0.0046
0.0004	0.0002	0.0002		0.0004				0.0004	0.0016	0.0073		0.0088	0.0099	0.0059	0.0130
0.0003	0.0002	0.0001		0.0003				0.0003	0.0012	0.0054		0.0066	0.0074	0.0044	0.0097
0.0003	0.0002	0.0001		0.0003				0.0003	0.0012	0.0043		0.0055	0.0103	0.0046	0.0098
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0001	0.0000	0.0001
0.0006	0.0004	0.0002		0.0005				0.0005	0.0027	0.0071		0.0098	0.0207	0.0072	0.0152
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0001	0.0000	0.0001
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0002	0.0000	0.0001
0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0001		0.0002	0.0005	0.0001	0.0006
0.0001	0.0001	0.0000		0.0001				0.0001	0.0005	0.0001		0.0006	0.0037	0.0002	0.0008
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0002		0.0002	0.0004	0.0002	0.0001
0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0005		0.0006	0.0009	0.0006	0.0003
0.0001	0.0000	0.0000		0.0000				0.0000	0.0001	0.0008		0.0009	0.0011	0.0008	0.0005
0.0001	0.0000	0.0000		0.0001				0.0001	0.0002	0.0011		0.0014	0.0017	0.0012	0.0008
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0001	0.0001	0.0002
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
0.0284	0.0046	0.0203		0.0249				0.0249	0.0157	0.2999		0.3155	0.4877	0.1555	0.0703
0.0396	0.0069	0.0279		0.0348				0.0348	0.0232	0.4125		0.4357	0.8213	0.3299	0.1177
0.0166	0.0026	0.0120		0.0146				0.0146	0.0087	0.1775		0.1862	0.3069	0.1420	0.0507
0.0002	0.0001	0.0001		0.0002				0.0002	0.0004	0.0014		0.0018	0.0081	0.0008	0.0008
0.0007	0.0002	0.0005		0.0006				0.0006	0.0010	0.0070		0.0081	0.0207	0.0040	0.0041
0.0008	0.0003	0.0004		0.0007				0.0007	0.0016	0.0064		0.0080	0.0327	0.0039	0.0040
0.0007	0.0003	0.0003		0.0006				0.0006	0.0016	0.0045		0.0061	0.0193	0.0034	0.0072
0.0002	0.0001	0.0001		0.0001				0.0001	0.0002	0.0009		0.0011	0.0062	0.0009	0.0010
0.0002	0.0000	0.0001		0.0001				0.0001	0.0002	0.0016		0.0018	0.0031	0.0008	0.0013
0.0010	0.0002	0.0007		0.0008				0.0008	0.0009	0.0098		0.0107	0.0187	0.0053	0.0088
0.0034	0.0005	0.0025		0.0030				0.0030	0.0023	0.0376		0.0399	0.0471	0.0198	0.0331
0.0217	0.0031	0.0160		0.0190				0.0190	0.0144	0.2361		0.2504	0.3537	0.1419	0.2253
0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0002		0.0002	0.0007	0.0001	0.0009
0.0000	0.0000			0.0000				0.0000	0.0000			0.0000	0.0000		
0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	1.2	0.0	1.4	2.3	0.8	0.6

NOx_TOTEX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CO2_TOTEX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_TOTEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_TOTEX
0.0052	3.97	0.0465		4.01	0.0000	0.0000		0.0000	0.0000	0.0002	0.0003	0.0000	0.0000		0.0000
0.0001	1.13			1.13	0.0000			0.0000	0.0001	0.0001	0.0001	0.0000			0.0000
0.0000	0.0025			0.0025	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000
0.0007	5.37			5.37	0.0001			0.0001	0.0002	0.0002	0.0005	0.0001			0.0001
0.0431	69.9	0.4324		70.3	0.0024	0.0001		0.0025	0.0014	0.0091	0.0130	0.0023	0.0001		0.0024
0.0292	38.9	0.3521		39.2	0.0015	0.0001		0.0015	0.0007	0.0050	0.0072	0.0014	0.0000		0.0014
0.0005	11.1			11.1	0.0000			0.0000	0.0003	0.0004	0.0007	0.0000			0.0000
0.0102	4.25			4.25	0.0001			0.0001	0.0001	0.0002	0.0004	0.0001			0.0001
0.0034	4.08	0.1751		4.25	0.0001	0.0000		0.0001	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001
0.0354	24.5			24.5	0.0001			0.0001			0.0001	0.0001			0.0001
0.0053	5.10	0.4343		5.54	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003	0.0000	0.0000		0.0000
0.0001	0.4427	0.0031		0.4458	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0002	0.6083	0.0038		0.6122	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0006	1.58	0.0173		1.60	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000
0.0045	16.3	0.0451		16.3	0.0001	0.0000		0.0001	0.0002	0.0008	0.0011	0.0001	0.0000		0.0001
0.0059	6.31	0.3214		6.63	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004	0.0000	0.0000		0.0000
0.0039	4.11	0.2093		4.32	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002	0.0000	0.0000		0.0000
0.0168	17.8	0.9082		18.7	0.0000	0.0000		0.0000	0.0002	0.0008	0.0011	0.0000	0.0000		0.0000
0.0070	6.99	0.2359		7.23	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004	0.0000	0.0000		0.0000
0.0101	13.2	0.6354		13.8	0.0000	0.0000		0.0000	0.0002	0.0006	0.0008	0.0000	0.0000		0.0000
0.0287	37.3	1.79		39.1	0.0001	0.0000		0.0001	0.0004	0.0017	0.0022	0.0001	0.0000		0.0001
0.0215	27.7	1.33		29.1	0.0001	0.0000		0.0001	0.0003	0.0012	0.0017	0.0001	0.0000		0.0001
0.0247	23.1	1.13		24.2	0.0001	0.0000		0.0001	0.0003	0.0010	0.0014	0.0001	0.0000		0.0001
0.0003	0.3603	0.0150		0.3752	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0430	50.5	1.81		52.3	0.0002	0.0000		0.0002	0.0007	0.0025	0.0033	0.0002	0.0000		0.0002
0.0003	0.5819	0.0040		0.5860	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0004	0.7988	0.0050		0.8038	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000
0.0013	2.08	0.0224		2.11	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000
0.0047	13.6	0.0275		13.7	0.0001	0.0000		0.0001	0.0002	0.0007	0.0010	0.0001	0.0000		0.0001
0.0007	0.6427	0.0479		0.6905	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0018	1.80	0.1354		1.94	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000
0.0025	2.77	0.2068		2.97	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000
0.0037	4.69	0.2842		4.97	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003	0.0000	0.0000		0.0000
0.0004	0.6565	0.0228		0.6793	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0001	0.1241	0.0043		0.1284	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0001	0.1704	0.0048		0.1752	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.7135	514.6	38.8		553.4	0.0120	0.0001		0.0121	0.0146	0.0332	0.0599	0.0115	0.0001		0.0116
1.27	750.6	51.1		801.7	0.0181	0.0001		0.0182	0.0222	0.0506	0.0910	0.0173	0.0001		0.0174
0.4995	272.6	22.0		294.5	0.0069	0.0001		0.0070	0.0081	0.0184	0.0335	0.0066	0.0000		0.0067
0.0096	8.86	0.1754		9.04	0.0001	0.0000		0.0001	0.0002	0.0006	0.0010	0.0001	0.0000		0.0001
0.0288	21.9	0.9005		22.8	0.0003	0.0000		0.0003	0.0006	0.0015	0.0024	0.0003	0.0000		0.0003
0.0406	32.3	0.8327		33.1	0.0004	0.0000		0.0004	0.0008	0.0022	0.0035	0.0004	0.0000		0.0004
0.0299	17.2	0.6836		17.9	0.0001	0.0000		0.0001	0.0004	0.0012	0.0017	0.0001	0.0000		0.0001
0.0082	10.8	0.1508		10.9	0.0001	0.0000		0.0001	0.0001	0.0007	0.0008	0.0001	0.0000		0.0001
0.0052	5.54	0.2128		5.76	0.0001	0.0000		0.0001	0.0001	0.0003	0.0005	0.0001	0.0000		0.0001
0.0327	25.5	1.38		26.9	0.0003	0.0000		0.0003	0.0006	0.0015	0.0024	0.0003	0.0000		0.0003
0.1000	70.0	5.12		75.1	0.0008	0.0000		0.0008	0.0017	0.0042	0.0067	0.0007	0.0000		0.0008
0.7210	379.7	30.7		410.4	0.0065	0.0001		0.0066	0.0108	0.0258	0.0432	0.0062	0.0001		0.0063
0.0017	1.07	0.0225		1.09	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000
0.0000	0.0059			0.0059	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000
3.8	2,513.4	162.7	0.0	2,676.1	0.1	0.0	0.0	0.1	0.1	0.2	0.3	0.0	0.0	0.0	0.0

PM2_5_PMTW	PM2_5_PMBW	PM2_5_TOTAL	SOx_RUNEX	SOx_IDLEX	SOx_STREX	SOx_TOTEX	Fuel_GAS	Fuel_DSL	Fuel_NG
0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3612	
0.0000	0.0000	0.0000	0.0000			0.0000		0.1021	
0.0000	0.0000	0.0000	0.0000			0.0000		0.0002	
0.0000	0.0001	0.0002	0.0001			0.0001		0.4836	
0.0004	0.0032	0.0059	0.0007	0.0000		0.0007		6.33	
0.0002	0.0018	0.0034	0.0004	0.0000		0.0004		3.53	
0.0001	0.0001	0.0002	0.0001			0.0001		1.00	
0.0000	0.0001	0.0002	0.0000			0.0000		0.3826	
0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3827	
		0.0001	0.0002			0.0002		2.21	
0.0000	0.0001	0.0001	0.0000	0.0000		0.0001		0.4982	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0401	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0551	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1439	
0.0001	0.0003	0.0004	0.0002	0.0000		0.0002		1.47	
0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.5968	
0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3890	
0.0001	0.0003	0.0004	0.0002	0.0000		0.0002		1.69	
0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.6505	
0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		1.25	
0.0001	0.0006	0.0008	0.0004	0.0000		0.0004		3.52	
0.0001	0.0004	0.0006	0.0003	0.0000		0.0003		2.61	
0.0001	0.0004	0.0005	0.0002	0.0000		0.0002		2.18	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0338	
0.0002	0.0009	0.0012	0.0005	0.0000		0.0005		4.71	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0527	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0723	
0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.1895	
0.0000	0.0002	0.0004	0.0001	0.0000		0.0001		1.23	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0621	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1746	
0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2676	
0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.4473	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0611	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0116	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0158	
0.0037	0.0116	0.0268	0.0049	0.0004		0.0053		49.8	
0.0056	0.0177	0.0407	0.0072	0.0005		0.0076		72.2	
0.0020	0.0064	0.0152	0.0026	0.0002		0.0028		26.5	
0.0001	0.0002	0.0004	0.0001	0.0000		0.0001		0.8136	
0.0001	0.0005	0.0009	0.0002	0.0000		0.0002		2.05	
0.0002	0.0008	0.0014	0.0003	0.0000		0.0003		2.98	
0.0001	0.0004	0.0006	0.0002	0.0000		0.0002		1.61	
0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		0.9845	
0.0000	0.0001	0.0002	0.0001	0.0000		0.0001		0.5182	
0.0002	0.0005	0.0010	0.0002	0.0000		0.0003		2.42	
0.0004	0.0015	0.0027	0.0007	0.0000		0.0007		6.76	
0.0027	0.0090	0.0180	0.0036	0.0003		0.0039		36.9	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0983	
0.0000	0.0000	0.0000	0.0000			0.0000		0.0005	
0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	240.8	0.0

EMFAC2011 Category	Population	Total_VMT	cVMT	eVMT	Trips	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_TOTEX	TOG_DIURN	TOG_HTSK	TOG_RUNLS	TOG_TOTAL
All Vehicles	588,960.3	23,220,752.0	20,544,322.6	2,676,429.4	3,063,084.4	0.2435	0.1058	0.4249	0.7742	0.6634	0.1892	0.5500	2.18
All Other Buses - Dsl	77.5	3,451.8	3,451.8	0	690.0	0.0002	0.0000		0.0002				0.0002
All Other Buses - Oth	6.05	254.0	254.0	0	53.9	0.0002	0.0000		0.0003				0.0003
LDA - Dsl	157.8	5,610.2	5,610.2	0	701.7	0.0000			0.0000				0.0000
LDA - Oth	33,321.8	1,253,943.4	0	1,253,943.4	155,557.3				0				0
LDA - Gas	244,598.2	9,624,333.0	9,624,333.0	0	1,129,109.6	0.0499		0.1660	0.2158	0.2751	0.0495	0.2056	0.7460
LDA - Gas	11,492.3	454,271.5	185,430.8	268,840.7	47,520.5	0.0010		0.0098	0.0108	0.0122	0.0022	0.0048	0.0299
LDT1 - Dsl	0.1782	6.75	6.75	0	0.8214	0.0000			0.0000				0.0000
LDT1 - Oth	457.3	17,355.0	0	17,355.0	2,141.8				0				0
LDT1 - Gas	15,836.3	569,902.6	569,902.6	0	71,358.6	0.0032		0.0115	0.0147	0.0252	0.0042	0.0185	0.0625
LDT1 - Gas	351.3	13,793.3	5,614.8	8,178.4	1,452.7	0.0000		0.0003	0.0003	0.0003	0.0001	0.0001	0.0008
LDT2 - Dsl	505.1	19,222.6	19,222.6	0	2,329.2	0.0004			0.0004				0.0004
LDT2 - Oth	5,226.1	137,057.0	0	137,057.0	24,463.5				0				0
LDT2 - Gas	133,850.6	5,039,094.4	5,039,094.4	0	613,955.2	0.0362		0.1208	0.1569	0.1662	0.0287	0.1241	0.4759
LDT2 - Gas	3,599.3	138,544.5	56,495.6	82,048.9	14,882.9	0.0003		0.0031	0.0034	0.0034	0.0006	0.0013	0.0087
LHD1 - Dsl	3,313.5	104,706.5	104,706.5	0	41,679.7	0.0123	0.0005		0.0127				0.0127
LHD1 - Oth	5,290.7	221,506.3	0	221,506.3	74,448.8				0				0
LHD1 - Gas	5,047.4	168,956.2	168,956.2	0	75,199.5	0.0011	0.0023	0.0079	0.0113	0.0127	0.0018	0.0172	0.0430
LHD2 - Dsl	1,649.0	49,710.3	49,710.3	0	20,742.1	0.0073	0.0002		0.0076				0.0076
LHD2 - Oth	1,231.4	50,357.5	0	50,357.5	16,296.1				0				0
LHD2 - Gas	531.1	17,508.2	17,508.2	0	7,912.0	0.0001	0.0002	0.0007	0.0010	0.0014	0.0002	0.0019	0.0045
MCY - Gas	10,299.9	53,861.2	53,861.2	0	20,599.8	0.0645		0.0228	0.0873	0.0445	0.0812	0.0884	0.3014
MDV - Dsl	892.0	30,505.1	30,505.1	0	4,010.9	0.0003			0.0003				0.0003
MDV - Oth	4,845.7	125,607.6	0	125,607.6	22,589.3				0				0
MDV - Gas	79,737.7	2,785,657.8	2,785,657.8	0	361,220.2	0.0217		0.0786	0.1004	0.1173	0.0200	0.0855	0.3231
MDV - Gas	2,302.0	83,562.9	34,090.8	49,472.1	9,518.9	0.0002		0.0020	0.0021	0.0023	0.0004	0.0009	0.0058
MH - Dsl	395.6	3,525.7	3,525.7	0	39.6	0.0004			0.0004				0.0004
MH - Gas	595.2	6,140.9	6,140.9	0	59.5	0.0001		0.0000	0.0001	0.0014	0.0002	0.0000	0.0017
Motor Coach - Dsl	19.0	2,408.9	2,408.9	0	436.2	0.0000	0.0001		0.0001				0.0001
OBUS - Oth	42.0	2,876.4	0	2,876.4	839.6				0				0
OBUS - Gas	68.2	2,404.0	2,404.0	0	1,365.0	0.0001	0.0001	0.0003	0.0004	0.0003	0.0000	0.0003	0.0011
PTO-Dsl	0	12,769.7	12,769.7	0		0.0002			0.0002				0.0002
PTO-Oth	0	12,712.9	0	12,712.9					0				0
SBUS - Dsl	211.8	4,461.6	4,461.6	0	3,067.4	0.0000	0.0000		0.0001				0.0001
SBUS - Oth	28.0	6,764.2	0	6,764.2	3,221.9				0				0
SBUS - Gas	84.4	4,480.1	4,480.1	0	337.5	0.0001	0.0014	0.0002	0.0017	0.0005	0.0001	0.0003	0.0025
SBUS-Oth	70.6	1,452.6	1,452.6	0	1,022.1	0.0038	0.0010		0.0047				0.0047
T6 CAIRP small-Dsl	5.48	394.3	394.3	0	126.0	0.0000	0.0000		0.0000				0.0000
T6 CAIRP small-Oth	7.49	570.0	0	570.0	172.0				0				0
T6 CAIRP small-Dsl	6.74	541.7	541.7	0	154.9	0.0000	0.0000		0.0000				0.0000
T6 CAIRP small-Oth	9.17	781.2	0	781.2	210.8				0				0
T6 CAIRP small-Dsl	30.6	1,410.2	1,410.2	0	703.1	0.0000	0.0000		0.0000				0.0000
T6 CAIRP small-Oth	42.0	2,046.7	0	2,046.7	966.0				0				0
T6 CAIRP heavy-Dsl	81.2	16,434.9	16,434.9	0	1,866.9	0.0001	0.0000		0.0001				0.0001
T6 CAIRP heavy-Oth	25.0	5,248.2	0	5,248.2	574.3				0				0
T6 instate small-Dsl	165.5	5,458.9	5,458.9	0	2,362.3	0.0000	0.0000		0.0001				0.0001
T6 instate small-Oth	175.7	6,194.3	0	6,194.3	2,506.7				0				0
T6 instate small-Dsl	107.8	3,554.5	3,554.5	0	1,538.3	0.0000	0.0000		0.0000				0.0000
T6 instate small-Oth	114.1	4,025.3	0	4,025.3	1,627.8				0				0
T6 instate small-Dsl	467.7	15,422.3	15,422.3	0	6,674.6	0.0001	0.0001		0.0002				0.0002
T6 instate small-Oth	495.4	17,472.5	0	17,472.5	7,068.7				0				0
T6 instate heavy-Dsl	116.3	5,893.7	5,893.7	0	1,659.6	0.0001	0.0000		0.0001				0.0001
T6 instate heavy-Oth	70.4	3,781.7	0	3,781.7	1,004.0				0				0
T6 instate heavy-NG	4.16	205.7	205.7	0	59.4	0.0002	0.0001		0.0003				0.0003
T6 instate small-Dsl	304.3	11,793.3	11,793.3	0	3,517.5	0.0001	0.0001		0.0001				0.0001
T6 instate small-Oth	322.0	14,105.5	0	14,105.5	3,722.4				0				0
T6 instate small-Dsl	859.0	33,297.2	33,297.2	0	9,929.5	0.0002	0.0002		0.0004				0.0004
T6 instate small-Oth	907.9	39,823.9	0	39,823.9	10,495.1				0				0
T6 instate small-Dsl	639.1	24,753.0	24,753.0	0	7,387.6	0.0002	0.0001		0.0003				0.0003
T6 instate small-Oth	674.5	29,556.7	0	29,556.7	7,796.7				0				0
T6 instate heavy-Dsl	515.5	20,449.8	20,449.8	0	5,959.2	0.0002	0.0001		0.0003				0.0003
T6 instate heavy-Oth	298.9	16,061.1	0	16,061.1	3,455.1				0				0
T6 instate heavy-NG	12.9	508.2	508.2	0	149.6	0.0004	0.0002		0.0006				0.0006
T6 instate small-Dsl	7.17	321.7	321.7	0	82.9	0.0000	0.0000		0.0000				0.0000
T6 instate small-Oth	7.57	397.4	0	397.4	87.5				0				0
T6 instate heavy-Dsl	846.6	48,980.0	48,980.0	0	9,787.3	0.0004	0.0002		0.0006				0.0006
T6 instate heavy-Oth	169.4	11,801.1	0	11,801.1	1,958.1				0				0
T6 instate heavy-NG	22.5	1,276.5	1,276.5	0	260.4	0.0010	0.0003		0.0013				0.0013
T6 OOS small-Dsl	7.55	552.1	552.1	0	173.6	0.0000	0.0000		0.0000				0.0000
T6 OOS small-Dsl	9.29	757.4	757.4	0	213.4	0.0000	0.0000		0.0000				0.0000
T6 OOS small-Dsl	42.1	1,979.2	1,979.2	0	967.4	0.0000	0.0000		0.0000				0.0000
T6 OOS heavy-Dsl	51.8	14,391.3	14,391.3	0	1,190.8	0.0001	0.0000		0.0001				0.0001
T6 Public-Dsl	15.6	534.3	534.3	0	79.8	0.0000	0.0000		0.0000				0.0000
T6 Public-Oth	14.2	560.9	0	560.9	73.1				0				0
T6 Public-NG	2.07	71.8	71.8	0	10.6	0.0001	0.0000		0.0001				0.0001
T6 Public-Dsl	43.6	1,495.1	1,495.1	0	223.6	0.0000	0.0000		0.0000				0.0000
T6 Public-Oth	39.7	1,560.8	0	1,560.8	203.8				0				0
T6 Public-NG	6.27	214.1	214.1	0	32.1	0.0002	0.0001		0.0003				0.0003
T6 Public-Dsl	67.2	2,301.8	2,301.8	0	344.8	0.0000	0.0000		0.0001				0.0001
T6 Public-Oth	60.8	2,379.8	0	2,379.8	312.1				0				0
T6 Public-NG	8.99	310.6	310.6	0	46.1	0.0003	0.0002		0.0005				0.0005
T6 Public-Dsl	94.3	3,946.3	3,946.3	0	483.8	0.0000	0.0000		0.0001				0.0001
T6 Public-Oth	68.3	3,276.7	0	3,276.7	350.2				0				0
T6 Public-NG	13.4	558.4	558.4	0	68.5	0.0006	0.0003		0.0008				0.0008
T6 Utility-Dsl	14.7	583.6	583.6	0	187.5	0.0000	0.0000		0.0000				0.0000
T6 Utility-Oth	20.9	858.0	0	858.0	267.0				0				0
T6 Utility-NG	0.0331	1.32	1.32	0	0.4234	0.0000	0.0000		0.0000				0.0000
T6 Utility-Dsl	2.77	110.3	110.3	0	35.5	0.0000	0.0000		0.0000				0.0000
T6 Utility-Oth	3.94	162.1	0	162.1	50.4				0				0
T6 Utility-NG	0.0063	0.2490	0.2490	0	0.0800	0.0000	0.0000		0.0000				0.0000
T6 Utility-Dsl	3.07	151.4	151.4	0	39.4	0.0000	0.0000		0.0000				0.0000
T6 Utility-Oth	4.38	227.7	0	227.7	56.1				0				0
T6 Utility-NG	0.0069	0.3417	0.3417	0	0.0888	0.0000	0.0000		0.0000				0.0000
T6TS - Gas	239.9	16,090.8	0	16,090.8	4,799.6				0				0
T6TS - Gas	261.8	13,277.4	13,277.4	0	5,237.3	0.0002	0.0004	0.0012	0.0018	0.0006	0.0001	0.0011	0.0036
T7 CAIRP-Dsl	1,743.9	363,673.4	363,673.4	0	40,074.1	0.0052	0.0228		0.0280				0.0280
T7 CAIRP-Oth	485.6	104,985.2	0	104,985.2	11,159.3				0				0
T7 NNOOS-Dsl	1,932.9	554,098.9	554,098.9	0	44,418.8	0.0077	0.0314		0.0391				0.0391
T7 NOOS-Dsl	831.9	201,294.3	201,294.3	0	19,116.2	0.0029	0.0135		0.0164				0.0164
T7 Other Port-Dsl	24.3	5,839.6	5,839.6	0	397.2	0.0001	0.0001		0.0002				0.0002
T7 Other Port-Oth	5.61	1,478.2	0	1,478.2	91.8				0				0
T7 POAK-Dsl	124.6	14,452.3	14,452.3	0	2,039.0	0.0002	0.0005		0.0007				0.0007
T7 POAK-Oth	29.0	3,327.7	0	3,327.7	474.8				0				0
T7 POLA-Dsl	113.7	21,086.7	21,086.7	0	1,860.1	0.0003	0.0005		0.0008				0.0008
T7 POLA-Oth	20.7	3,790.1	0	3,790.1	338.1				0				0
T7 POLA-NG	0.5337	98.9	98.9	0	8.73	0.0001	0.0000		0.0002				0.0002
T7 Public-Dsl	240.7	9,691.7	9,691.7	0	1,234.6	0.0003	0.0004		0.0007				0.0007
T7 Public-Oth	167.4	7,886.7	0	7,886.7	858.9				0				0
T7 Public-NG	30.4	1,227.2	1,227.2	0	155.7	0.0024	0.0006		0.0030				0.0030
T7 SWCV-Dsl	44.2	2,866.0	2,866.0	0	203.2	0.0001	0.0001		0.0002				0.0002
T7 SWCV-Oth	115.5	7,474.8	0	7,474.8	531.3				0				0
T7 SWCV-NG	117.0	7,581.3	7,581.3	0	538.2	0.0041	0.0004		0.0045				0.0045
T7 Single-Dsl	52.4	3,461.9	3,461.9	0	493.9	0.0000	0.0001		0.0002				0.0002
Single Concrete/Transit Mix	67.3	4,802.2	0	4,802.2	634.3				0				0
T7 Single-NG	1.91	126.0	126.0	0	18.0	0.0002	0.0001		0.0002				0.0002
T7 Single-Dsl	319.5	15,507.4	15,507.4	0	3,009.6	0.0002	0.0007		0.0009				0.0009
T7 Single Dump-Oth	225.0	14,216.6	0	14,216.6	2,119.6				0				0
T7 Single-NG	11.4	557.9	557.9	0	107.6	0.0007	0.0004		0.0010				0.0010
T7 Single-Dsl	1,225.6	43,098.0	43,098.0	0	11,545.0	0.0005	0.0029		0.0034				0.0034
T7 Single Other-Oth	1,026.6	45,006.0	0	45,006.0	9,670.8				0				0
T7 Single-NG	44.2	1,559.5	1,559.5	0	415.9	0.0019	0.0013		0.0032				0.0032
T7 Tractor-Dsl	4,145.1	269,177.9	269,177.9	0	60,228.5	0.0034	0.0180		0.0214				0.0214
T7 Tractor-Oth	759.8	54,549.3	0	54,549.3	11,039.4				0				0
T7 Tractor-NG	65.1	4,220.8	4,220.8	0	945.8	0.0048	0.0036		0.0084				0.0084
T7 Utility-Dsl	15.2	627.5	627.5	0	194.8	0.0000	0.0000		0.0000				0.0000
T7 Utility-Oth	10.8	511.8	0	511.8	138.1				0				0
T7IS - Gas	0.3196	51.5	0	51.5	6.40				0				0
T7IS - Gas	0.3662	45.9	45.9	0	7.33	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
UBUS - Dsl	0.2230	8.05	8.05	0	0.8919	0.0000			0.0000				0.0000
UBUS - Oth	217.4	14,646.5	0	14,646.5	869.5				0				0
UBUS - Gas	0.0000	0.0026	0.0026	0	0.0001	0		0	0	0	0	0	0
UBUS - NG	0.8983	32.4	32.4	0	3.59	0.0000			0.0000				0.0000

EMFAC2011 Category	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_TOTEX	ROG_DIURN	ROG_HTSK	ROG_RUNLS	ROG_TOTAL	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX
All Vehicles	0.1688	0.0848	0.3882	0.6418	0.6634	0.1892	0.5500	2.04	12.9	1.29	5.07	19.3
All Other Buses - Dsl	0.0002	0.0000		0.0002				0.0002	0.0007	0.0002		0.0008
All Other Buses - Oth	0.0000	0.0000		0.0000				0.0000	0.0010	0.0001		0.0010
LDA - Dsl	0.0000			0.0000				0.0000	0.0012			0.0012
LDA - Oth				0				0				0
LDA - Gas	0.0342		0.1516	0.1858	0.2751	0.0495	0.2056	0.7159	5.78		2.04	7.82
LDA - Gas	0.0007		0.0089	0.0096	0.0122	0.0022	0.0048	0.0288	0.1050		0.0686	0.1736
LDT1 - Dsl	0.0000			0.0000				0.0000	0.0000			0.0000
LDT1 - Oth				0				0				0
LDT1 - Gas	0.0022		0.0105	0.0127	0.0252	0.0042	0.0185	0.0605	0.3617		0.1355	0.4972
LDT1 - Gas	0.0000		0.0003	0.0003	0.0003	0.0001	0.0001	0.0008	0.0032		0.0021	0.0053
LDT2 - Dsl	0.0004			0.0004				0.0004	0.0040			0.0040
LDT2 - Oth				0				0				0
LDT2 - Gas	0.0248		0.1103	0.1351	0.1662	0.0287	0.1241	0.4540	3.54		1.42	4.96
LDT2 - Gas	0.0002		0.0028	0.0030	0.0034	0.0006	0.0013	0.0084	0.0320		0.0215	0.0535
LHD1 - Dsl	0.0108	0.0004		0.0112				0.0112	0.0280	0.0033		0.0313
LHD1 - Oth				0				0				0
LHD1 - Gas	0.0008	0.0016	0.0072	0.0095	0.0127	0.0018	0.0172	0.0412	0.1109	0.0210	0.2706	0.4026
LHD2 - Dsl	0.0064	0.0002		0.0066				0.0066	0.0170	0.0017		0.0187
LHD2 - Oth				0				0				0
LHD2 - Gas	0.0001	0.0001	0.0007	0.0009	0.0014	0.0002	0.0019	0.0044	0.0116	0.0022	0.0290	0.0428
MCY - Gas	0.0516		0.0210	0.0726	0.0445	0.0812	0.0884	0.2867	0.6311		0.1753	0.8064
MDV - Dsl	0.0002			0.0002				0.0002	0.0070			0.0070
MDV - Oth				0				0				0
MDV - Gas	0.0149		0.0718	0.0867	0.1173	0.0200	0.0855	0.3094	2.04		0.8690	2.91
MDV - Gas	0.0001		0.0018	0.0019	0.0023	0.0004	0.0009	0.0056	0.0193		0.0137	0.0330
MH - Dsl	0.0003			0.0003				0.0003	0.0010			0.0010
MH - Gas	0.0001		0.0000	0.0001	0.0014	0.0002	0.0000	0.0017	0.0011		0.0002	0.0012
Motor Coach - Dsl	0.0000	0.0001		0.0001				0.0001	0.0001	0.0012		0.0013
OBUS - Oth				0				0				0
OBUS - Gas	0.0001	0.0001	0.0002	0.0004	0.0003	0.0000	0.0003	0.0010	0.0011	0.0004	0.0047	0.0062
PTO-Dsl	0.0002			0.0002				0.0002	0.0025			0.0025
PTO-Oth				0				0				0
SBUS - Dsl	0.0000	0.0000		0.0001				0.0001	0.0003	0.0016		0.0019
SBUS - Oth				0				0				0
SBUS - Gas	0.0000	0.0010	0.0001	0.0012	0.0005	0.0001	0.0003	0.0021	0.0010	0.0076	0.0031	0.0117
SBUS-Oth	0.0001	0.0000		0.0001				0.0001	0.0102	0.0027		0.0129
T6 CAIRP small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000
T6 CAIRP small-Oth				0				0				0
T6 CAIRP small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000
T6 CAIRP small-Oth				0				0				0
T6 CAIRP small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001
T6 CAIRP small-Oth				0				0				0
T6 CAIRP heavy-Dsl	0.0001	0.0000		0.0001				0.0001	0.0005	0.0002		0.0007
T6 CAIRP heavy-Oth				0				0				0
T6 instate small-Dsl	0.0000	0.0000		0.0001				0.0001	0.0003	0.0013		0.0016
T6 instate small-Oth				0				0				0
T6 instate small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0002	0.0008		0.0010
T6 instate small-Oth				0				0				0
T6 instate small-Dsl	0.0001	0.0001		0.0002				0.0002	0.0009	0.0036		0.0045
T6 instate small-Oth				0				0				0
T6 instate heavy-Dsl	0.0001	0.0000		0.0001				0.0001	0.0004	0.0009		0.0013
T6 instate heavy-Oth				0				0				0
T6 instate heavy-NG	0.0000	0.0000		0.0000				0.0000	0.0009	0.0002		0.0010
T6 instate small-Dsl	0.0001	0.0001		0.0001				0.0001	0.0005	0.0025		0.0031
T6 instate small-Oth				0				0				0
T6 instate small-Dsl	0.0002	0.0002		0.0004				0.0004	0.0015	0.0072		0.0087
T6 instate small-Oth				0				0				0
T6 instate small-Dsl	0.0001	0.0001		0.0003				0.0003	0.0011	0.0053		0.0065
T6 instate small-Oth				0				0				0
T6 instate heavy-Dsl	0.0002	0.0001		0.0003				0.0003	0.0012	0.0043		0.0055
T6 instate heavy-Oth				0				0				0
T6 instate heavy-NG	0.0000	0.0000		0.0000				0.0000	0.0015	0.0006		0.0021
T6 instate small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001
T6 instate small-Oth				0				0				0
T6 instate heavy-Dsl	0.0004	0.0002		0.0005				0.0005	0.0026	0.0071		0.0097
T6 instate heavy-Oth				0				0				0
T6 instate heavy-NG	0.0000	0.0000		0.0000				0.0000	0.0038	0.0010		0.0048
T6 OOS small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000
T6 OOS small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000
T6 OOS small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0001	0.0001		0.0002
T6 OOS heavy-Dsl	0.0001	0.0000		0.0001				0.0001	0.0005	0.0001		0.0006
T6 Public-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0002		0.0002
T6 Public-Oth				0				0				0
T6 Public-NG	0.0000	0.0000		0.0000				0.0000	0.0002	0.0001		0.0004
T6 Public-Dsl	0.0000	0.0000		0.0000				0.0000	0.0001	0.0005		0.0006
T6 Public-Oth				0				0				0
T6 Public-NG	0.0000	0.0000		0.0000				0.0000	0.0007	0.0004		0.0011
T6 Public-Dsl	0.0000	0.0000		0.0000				0.0000	0.0001	0.0008		0.0009
T6 Public-Oth				0				0				0
T6 Public-NG	0.0000	0.0000		0.0000				0.0000	0.0010	0.0006		0.0016
T6 Public-Dsl	0.0000	0.0000		0.0001				0.0001	0.0002	0.0011		0.0013
T6 Public-Oth				0				0				0
T6 Public-NG	0.0000	0.0000		0.0000				0.0000	0.0019	0.0008		0.0027
T6 Utility-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001
T6 Utility-Oth				0				0				0
T6 Utility-NG	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000
T6 Utility-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000
T6 Utility-Oth				0				0				0
T6 Utility-NG	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000
T6 Utility-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000
T6 Utility-Oth				0				0				0
T6 Utility-NG	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000
T6TS - Gas				0				0				0
T6TS - Gas	0.0002	0.0003	0.0011	0.0015	0.0006	0.0001	0.0011	0.0033	0.0026	0.0044	0.0198	0.0269
T7 CAIRP-Dsl	0.0046	0.0201		0.0246				0.0246	0.0155	0.2964		0.3118
T7 CAIRP-Oth				0				0				0
T7 NNOOS-Dsl	0.0068	0.0276		0.0344				0.0344	0.0229	0.4077		0.4306
T7 NOOS-Dsl	0.0025	0.0119		0.0144				0.0144	0.0086	0.1755		0.1841
T7 Other Port-Dsl	0.0001	0.0001		0.0002				0.0002	0.0004	0.0014		0.0018
T7 Other Port-Oth				0				0				0
T7 POAK-Dsl	0.0002	0.0005		0.0006				0.0006	0.0010	0.0069		0.0080
T7 POAK-Oth				0				0				0
T7 POLA-Dsl	0.0002	0.0004		0.0007				0.0007	0.0016	0.0063		0.0079
T7 POLA-Oth				0				0				0
T7 POLA-NG	0.0000	0.0000		0.0000				0.0000	0.0005	0.0001		0.0006
T7 Public-Dsl	0.0003	0.0003		0.0006				0.0006	0.0015	0.0045		0.0060
T7 Public-Oth				0				0				0
T7 Public-NG	0.0000	0.0000		0.0000				0.0000	0.0110	0.0018		0.0128
T7 SWCV-Dsl	0.0001	0.0001		0.0001				0.0001	0.0002	0.0008		0.0010
T7 SWCV-Oth				0				0				0
T7 SWCV-NG	0.0001	0.0000		0.0001				0.0001	0.0842	0.0047		0.0889
T7 Single-Dsl	0.0000	0.0001		0.0001				0.0001	0.0002	0.0016		0.0018
Single Concrete/Transit Mix				0				0				0
T7 Single-NG	0.0000	0.0000		0.0000				0.0000	0.0006	0.0002		0.0007
T7 Single-Dsl	0.0002	0.0007		0.0008				0.0008	0.0009	0.0097		0.0106
T7 Single Dump-Oth				0				0				0
T7 Single-NG	0.0000	0.0000		0.0000				0.0000	0.0028	0.0010		0.0038
T7 Single-Dsl	0.0005	0.0025		0.0030				0.0030	0.0023	0.0372		0.0395
T7 Single Other-Oth				0				0				0
T7 Single-NG	0.0000	0.0000		0.0000				0.0000	0.0072	0.0041		0.0113
T7 Tractor-Dsl	0.0030	0.0158		0.0188				0.0188	0.0142	0.2333		0.2475
T7 Tractor-Oth				0				0				0
T7 Tractor-NG	0.0001	0.0001		0.0001				0.0001	0.0175	0.0113		0.0287
T7 Utility-Dsl	0.0000	0.0000		0.0000				0.0000	0.0001	0.0002		0.0002
T7 Utility-Oth				0				0				0
T7IS - Gas				0				0				0
T7IS - Gas	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015		0.0000	0.0016
UBUS - Dsl	0.0000			0.0000				0.0000	0.0000			0.0000
UBUS - Oth				0				0				0
UBUS - Gas	0		0	0	0	0	0	0	0.0000		0.0000	0.0000
UBUS - NG	0.0000			0.0000				0.0000	0.0000			0.0000

EMFAC2011 Category	NOx_RUNEX	NOx_IDLEX	NOx_STREX	NOx_TOTEX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CO2_TOTEX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_TOTEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL
All Vehicles	2.78	0.8436	1.09	4.72	7,879.5	165.1	145.8	8,190.4	0.0621	0.0005	0.0022	0.0648	0.2618	0.4256	0.7522
All Other Buses - Dsl	0.0043	0.0002	0.0007	0.0052	3.92	0.0460		3.97	0.0000	0.0000		0.0000	0.0000	0.0002	0.0003
All Other Buses - Oth	0.0000	0.0000		0.0000	0.2394	0.0073		0.2467	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
LDA - Dsl	0.0001			0.0001	1.12			1.12	0.0000			0.0000	0.0000	0.0001	0.0001
LDA - Oth				0				0				0	0.0111	0.0061	0.0171
LDA - Gas	0.2157		0.2056	0.4213	2,395.6		62.4	2,458.0	0.0059		0.0010	0.0069	0.0849	0.0984	0.1902
LDA - Gas	0.0015		0.0060	0.0075	61.6		2.75	64.4	0.0001		0.0000	0.0002	0.0040	0.0021	0.0063
LDT1 - Dsl	0.0000			0.0000	0.0025			0.0025	0.0000			0.0000	0.0000	0.0000	0.0000
LDT1 - Oth				0				0				0	0.0002	0.0001	0.0002
LDT1 - Gas	0.0137		0.0141	0.0278	163.8		4.63	168.4	0.0004		0.0001	0.0004	0.0050	0.0069	0.0123
LDT1 - Gas	0.0000		0.0002	0.0002	1.87		0.0966	1.96	0.0000		0.0000	0.0000	0.0001	0.0001	0.0002
LDT2 - Dsl	0.0007			0.0007	5.31			5.31	0.0001			0.0001	0.0002	0.0002	0.0005
LDT2 - Oth				0				0				0	0.0012	0.0007	0.0019
LDT2 - Gas	0.1287		0.1400	0.2687	1,502.6		41.5	1,544.1	0.0032		0.0006	0.0037	0.0444	0.0602	0.1084
LDT2 - Gas	0.0004		0.0019	0.0023	18.8		1.04	19.8	0.0000		0.0000	0.0000	0.0012	0.0007	0.0019
LHD1 - Dsl	0.0385	0.0041		0.0426	69.1	0.4273		69.5	0.0024	0.0001		0.0025	0.0014	0.0090	0.0128
LHD1 - Oth				0				0				0	0.0020	0.0095	0.0115
LHD1 - Gas	0.0036	0.0001	0.0338	0.0375	137.8	0.5527	1.49	139.8	0.0002		0.0000	0.0002	0.0015	0.0145	0.0163
LHD2 - Dsl	0.0267	0.0022		0.0289	38.4	0.3480		38.8	0.0014	0.0000		0.0015	0.0007	0.0050	0.0071
LHD2 - Oth				0				0				0	0.0004	0.0025	0.0030
LHD2 - Gas	0.0004	0.0000	0.0031	0.0035	16.1	0.0678	0.1534	16.3	0.0000		0.0000	0.0000	0.0002	0.0018	0.0019
MCY - Gas	0.0284		0.0016	0.0300	9.90		0.4922	10.4	0.0001		0.0001	0.0002	0.0002	0.0007	0.0012
MDV - Dsl	0.0004			0.0004	11.0			11.0	0.0000			0.0000	0.0003	0.0004	0.0007
MDV - Oth				0				0				0	0.0011	0.0006	0.0017
MDV - Gas	0.0784		0.0902	0.1686	1,008.4		30.2	1,038.6	0.0018		0.0004	0.0021	0.0246	0.0338	0.0605
MDV - Gas	0.0003		0.0012	0.0015	11.3		0.8186	12.1	0.0000		0.0000	0.0000	0.0007	0.0004	0.0012
MH - Dsl	0.0101			0.0101	4.20			4.20	0.0001			0.0001	0.0001	0.0002	0.0004
MH - Gas	0.0014		0.0000	0.0015	13.1		0.0017	13.1	0.0000		0.0000	0.0000	0.0001	0.0003	0.0004
Motor Coach - Dsl	0.0025	0.0004	0.0005	0.0034	4.03	0.1731		4.20	0.0001	0.0000		0.0001	0.0000	0.0002	0.0003
OBUS - Oth				0				0				0	0.0000	0.0001	0.0001
OBUS - Gas	0.0008	0.0000	0.0005	0.0013	4.03	0.0250	0.0336	4.09	0.0000		0.0000	0.0000	0.0000	0.0001	0.0002
PTO-Dsl	0.0350			0.0350	24.2			24.2	0.0001			0.0001			0.0001
PTO-Oth				0				0				0			0
SBUS - Dsl	0.0018	0.0014	0.0020	0.0052	5.04	0.4293		5.47	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003
SBUS - Oth				0				0				0	0.0001	0.0002	0.0003
SBUS - Gas	0.0008	0.0001	0.0003	0.0012	3.67	0.2066	0.0138	3.89	0.0000		0.0000	0.0000	0.0000	0.0002	0.0003
SBUS-Oth	0.0003	0.0004		0.0006	1.62	0.3153		1.93	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 CAIRP small-Dsl	0.0001	0.0000	0.0000	0.0001	0.4375	0.0031		0.4406	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 CAIRP small-Oth				0				0				0	0.0000	0.0000	0.0000
T6 CAIRP small-Dsl	0.0001	0.0000	0.0001	0.0002	0.6012	0.0038		0.6050	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 CAIRP small-Oth				0				0				0	0.0000	0.0000	0.0000
T6 CAIRP small-Dsl	0.0003	0.0001	0.0003	0.0006	1.56	0.0171		1.58	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 CAIRP small-Oth				0				0				0	0.0000	0.0000	0.0001
T6 CAIRP heavy-Dsl	0.0035	0.0002	0.0008	0.0044	16.1	0.0446		16.1	0.0001	0.0000		0.0001	0.0002	0.0008	0.0011
T6 CAIRP heavy-Oth				0				0				0	0.0001	0.0001	0.0002
T6 instate small-Dsl	0.0021	0.0010	0.0027	0.0059	6.24	0.3176		6.55	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004
T6 instate small-Oth				0				0				0	0.0001	0.0002	0.0002
T6 instate small-Dsl	0.0014	0.0007	0.0018	0.0038	4.06	0.2069		4.27	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002
T6 instate small-Oth				0				0				0	0.0001	0.0001	0.0002
T6 instate small-Dsl	0.0061	0.0030	0.0076	0.0166	17.6	0.8976		18.5	0.0000	0.0000		0.0000	0.0002	0.0008	0.0010
T6 instate small-Oth				0				0				0	0.0002	0.0005	0.0007
T6 instate heavy-Dsl	0.0036	0.0010	0.0024	0.0070	6.91	0.2331		7.14	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004
T6 instate heavy-Oth				0				0				0	0.0001	0.0001	0.0001
T6 instate heavy-NG	0.0000	0.0000		0.0000	0.2257	0.0195		0.2452	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 instate small-Dsl	0.0035	0.0020	0.0045	0.0100	13.1	0.6279		13.7	0.0000	0.0000		0.0000	0.0002	0.0006	0.0008
T6 instate small-Oth				0				0				0	0.0002	0.0003	0.0005
T6 instate small-Dsl	0.0097	0.0058	0.0128	0.0284	36.9	1.77		38.6	0.0001	0.0000		0.0001	0.0004	0.0016	0.0022
T6 instate small-Oth				0				0				0	0.0005	0.0010	0.0015
T6 instate small-Dsl	0.0074	0.0043	0.0095	0.0212	27.4	1.32		28.7	0.0001	0.0000		0.0001	0.0003	0.0012	0.0016
T6 instate small-Oth				0				0				0	0.0004	0.0007	0.0011
T6 instate heavy-Dsl	0.0102	0.0045	0.0097	0.0244	22.8	1.12		23.9	0.0001	0.0000		0.0001	0.0003	0.0010	0.0014
T6 instate heavy-Oth				0				0				0	0.0002	0.0004	0.0006
T6 instate heavy-NG	0.0000	0.0001		0.0001	0.4729	0.0637		0.5366	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 instate small-Dsl	0.0001	0.0000	0.0001	0.0002	0.3560	0.0148		0.3708	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 instate small-Oth				0				0				0	0.0000	0.0000	0.0000
T6 instate heavy-Dsl	0.0204	0.0071	0.0150	0.0425	49.9	1.79		51.7	0.0002	0.0000		0.0002	0.0006	0.0024	0.0033
T6 instate heavy-Oth				0				0				0	0.0002	0.0003	0.0004
T6 instate heavy-NG	0.0001	0.0001		0.0002	1.17	0.1088		1.28	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 OOS small-Dsl	0.0001	0.0000	0.0001	0.0003	0.5751	0.0040		0.5791	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 OOS small-Dsl	0.0002	0.0000	0.0001	0.0004	0.7895	0.0049		0.7944	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 OOS small-Dsl	0.0005	0.0001	0.0006	0.0012	2.06	0.0222		2.08	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 OOS heavy-Dsl	0.0037	0.0002	0.0008	0.0046	13.5	0.0272		13.5	0.0001	0.0000		0.0001	0.0002	0.0007	0.0010
T6 Public-Dsl	0.0004	0.0002	0.0001	0.0007	0.6351	0.0473		0.6824	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Public-Oth				0				0				0	0.0000	0.0000	0.0000
T6 Public-NG	0.0000	0.0000		0.0000	0.0727	0.0142		0.0870	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Public-Dsl	0.0009	0.0005	0.0003	0.0017	1.78	0.1338		1.92	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 Public-Oth				0				0				0	0.0000	0.0000	0.0001
T6 Public-NG	0.0000	0.0001		0.0001	0.2178	0.0423		0.2601	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Public-Dsl	0.0011	0.0008	0.0005	0.0024	2.73	0.2044		2.94	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002
T6 Public-Oth				0				0				0	0.0000	0.0001	0.0001
T6 Public-NG	0.0000	0.0001		0.0001	0.3154	0.0620		0.3774	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Public-Dsl	0.0017	0.0012	0.0008	0.0036	4.63	0.2808		4.91	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003
T6 Public-Oth				0				0				0	0.0000	0.0001	0.0001
T6 Public-NG	0.0000	0.0001		0.0002	0.5675	0.0919		0.6594	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Dsl	0.0001	0.0001	0.0002	0.0004	0.6488	0.0225		0.6714	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Oth				0				0				0	0.0000	0.0000	0.0000
T6 Utility-NG	0.0000	0.0000		0.0000	0.0012	0.0001		0.0014	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Dsl	0.0000	0.0000	0.0000	0.0001	0.1226	0.0043		0.1269	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Oth				0				0				0	0.0000	0.0000	0.0000
T6 Utility-NG	0.0000	0.0000		0.0000	0.0002	0.0000		0.0003	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Dsl	0.0000	0.0000	0.0000	0.0001	0.1684	0.0047		0.1732	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Oth				0				0				0	0.0000	0.0000	0.0000
T6 Utility-NG	0.0000	0.0000		0.0000	0.0003	0.0000		0.0003	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6TS - Gas				0				0				0	0.0002	0.0004	0.0006
T6TS - Gas	0.0010	0.0000	0.0021	0.0031	22.3	0.1234	0.1771	22.6	0.0000		0.0000	0.0000	0.0002	0.0007	0.0009
T7 CAIRP-Dsl	0.4820	0.1537	0.0695	0.7051	508.6	38.3		546.9	0.0119	0.0001		0.0120	0.0144	0.0328	0.0592
T7 CAIRP-Oth				0				0				0	0.0042	0.0047	0.0089
T7 NNOOS-Dsl	0.8117	0.3261	0.1163	1.25	741.8	50.5		792.4	0.0179	0.0001		0.0180	0.0220	0.0500	0.0900
T7 NOOS-Dsl	0.3033	0.1403	0.0501	0.4937	269.4	21.7		291.1	0.0069	0.0001		0.0069	0.0080	0.0182	0.0331
T7 Other Port-Dsl	0.0080	0.0008	0.0008	0.0095	8.76	0.1733		8.93	0.0001	0.0000		0.0001	0.0002	0.0006	0.0009
T7 Other Port-Oth				0				0				0	0.0001	0.0001	0.0001
T7 POAK-Dsl	0.0205	0.0039	0.0041	0.0285	21.6	0.8900		22.5	0.0003	0.0000		0.0003	0.0006	0.0015	0.0023
T7 POAK-Oth				0				0				0	0.0001	0.0002	0.0003
T7 POLA-Dsl	0.0323	0.0038	0.0040	0.0402	31.9	0.8230		32.7	0.0004	0.0000		0.0004	0.0008	0.0022	0.0034
T7 POLA-Oth				0				0				0	0.0002	0.0002	0.0003
T7 POLA-NG	0.0000	0.0000		0.0000	0.1181	0.0087		0.1268	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T7 Public-Dsl	0.0191	0.0033	0.0071	0.0295	17.0	0.6756		17.7	0.0001	0.0000		0.0001	0.0004	0.0011	0.0016
T7 Public-Oth				0				0				0	0.0003	0.0005	0.0008
T7 Public-NG	0.0004	0.0002		0.0006	1.85	0.1807		2.03	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002
T7 SWCV-Dsl	0.0062	0.0009	0.0010	0.0081	10.7	0.1490		10.8	0.0001	0.0000		0.0001	0.0001	0.0007	0.0008
T7 SWCV-Oth				0				0				0	0.0003	0.0009	0.0012
T7 SWCV-NG	0.0027	0.0001		0.0028	10.4	0.7660		11.2	0.0000	0.0000		0.0000	0.0003	0.0018	0.0021
T7 Single-Dsl	0.0031	0.0008	0.0013	0.0051	5.48	0.2103		5.69	0.0001	0.0000		0.0001	0.0001	0.0003	0.0005
Single Concrete/Transit Mix				0				0				0	0.0002	0.0002	0.0004
T7 Single-NG	0.0000	0.0000		0.0000	0.1468	0.0174		0.1641	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T7 Single-Dsl	0.0185	0.0052	0.0087	0.0324	25.2	1.36		26.6	0.0003	0.0000		0.0003	0.0006	0.0015	0.0024
T7 Single Dump-Oth				0				0				0	0.0006	0.0007	0.0013
T7 Single-NG	0.0001	0.0001		0.0003	0.6646	0.1055		0.7701	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T7 Single-Dsl	0.0465	0.0196	0.0327	0.0988	69.2	5.06		74.3	0.0008	0.0000		0.0008	0.0017	0.0042	0.0067
T7 Single Other-Oth				0				0				0	0.0018	0.0022	0.0040
T7 Single-NG	0.0003	0.0006		0.0009	1.83	0.4046		2.23	0.0000	0.0000		0.0000	0.0001	0.0002	0.0002
T7 Tractor-Dsl	0.3496	0.1403	0.2227	0.7126	375.3	30.3		405.6	0.0064	0.0001		0.0065	0.0107	0.0255	0.0427
T7 Tractor-Oth				0				0				0	0.0022	0.0026	0.0048
T7 Tractor-NG	0.0008	0.0015		0.0023	4.71	1.08		5.78	0.0000	0.0000		0.0000	0.0002	0.0004	0.0006
T7 Utility-Dsl	0.0007	0.0001	0.0009	0.0017	1.06	0.0222		1.08	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T7 Utility-Oth				0				0				0	0.0000	0.0000	0.0000
T7IS - Gas				0				0				0	0.0000	0.0000	0.0000
T7IS - Gas	0.0001		0.0000	0.0001	0.0879		0.0003	0.0882	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
UBUS - Dsl	0.0000			0.0000	0.0058			0.0058	0.0000			0.0000	0.0000	0.0000	0.0000
UBUS - Oth				0				0				0	0.0004	0.0009	0.0013
UBUS - Gas	0		0	0	0.0000		0.0000	0.0000	0		0	0	0	0.0000	0.0000
UBUS - NG	0.0000			0.0000	0.0268			0.0268	0.0000			0.0000	0.0000	0.0000	0.0000

PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_TOTEX	PM2_5_PMTW	PM2_5_PMBW	PM2_5_TOTAL	SOx_RUNEX	SOx_IDLEX	SOx_STREX	SOx_TOTEX	Fuel_GAS	Fuel_DSL	Fuel_NG
0.0590	0.0005	0.0020	0.0615	0.0654	0.1490	0.2759	0.0775	0.0015	0.0015	0.0806	590.6	238.0	3.44
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3570	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0303
0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.1009	
			0	0.0028	0.0021	0.0049				0			
0.0054		0.0010	0.0063	0.0212	0.0345	0.0620	0.0240		0.0007	0.0247	263.1		
0.0001		0.0000	0.0001	0.0010	0.0007	0.0019	0.0006		0.0000	0.0006	6.88		
0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0002	
			0	0.0000	0.0000	0.0001				0			
0.0003		0.0001	0.0004	0.0013	0.0024	0.0041	0.0016		0.0000	0.0017	18.0		
0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000		0.0000	0.0000	0.2099		
0.0001			0.0001	0.0000	0.0001	0.0002	0.0001			0.0001		0.4779	
			0	0.0003	0.0002	0.0005				0			
0.0029		0.0005	0.0034	0.0111	0.0211	0.0356	0.0151		0.0004	0.0155	185.3		
0.0000		0.0000	0.0000	0.0003	0.0002	0.0006	0.0002		0.0000	0.0002	2.12		
0.0023	0.0001		0.0023	0.0003	0.0032	0.0058	0.0007	0.0000		0.0007		6.26	
			0	0.0005	0.0033	0.0038				0			
0.0002		0.0000	0.0002	0.0004	0.0051	0.0057	0.0014	0.0000	0.0000	0.0014	15.0		
0.0014	0.0000		0.0014	0.0002	0.0017	0.0033	0.0004	0.0000		0.0004		3.49	
			0	0.0001	0.0009	0.0010				0			
0.0000		0.0000	0.0000	0.0000	0.0006	0.0007	0.0002	0.0000	0.0000	0.0002	1.74		
0.0001		0.0001	0.0002	0.0001	0.0002	0.0005	0.0001		0.0000	0.0001	1.27		
0.0000			0.0000	0.0001	0.0001	0.0002	0.0001			0.0001		0.9899	
			0	0.0003	0.0002	0.0005				0			
0.0016		0.0003	0.0020	0.0061	0.0118	0.0199	0.0101		0.0003	0.0104	111.1		
0.0000		0.0000	0.0000	0.0002	0.0001	0.0003	0.0001		0.0000	0.0001	1.30		
0.0001			0.0001	0.0000	0.0001	0.0002	0.0000			0.0000		0.3782	
0.0000		0.0000	0.0000	0.0000	0.0001	0.0001	0.0001		0.0000	0.0001	1.39		
0.0001	0.0000		0.0001	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3782	
			0	0.0000	0.0000	0.0000				0			
0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.4362		
0.0001			0.0001			0.0001	0.0002			0.0002		2.18	
			0			0				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0001		0.4924	
			0	0.0000	0.0001	0.0001				0			
0.0000		0.0000	0.0000	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.4171		
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.2375
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0397	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0545	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1422	
			0	0.0000	0.0000	0.0000				0			
0.0001	0.0000		0.0001	0.0001	0.0003	0.0004	0.0002	0.0000		0.0002		1.45	
			0	0.0000	0.0000	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.5898	
			0	0.0000	0.0001	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3844	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0001				0			
0.0000	0.0000		0.0000	0.0001	0.0003	0.0004	0.0002	0.0000		0.0002		1.67	
			0	0.0001	0.0002	0.0002				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.6429	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0302
0.0000	0.0000		0.0000	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		1.23	
			0	0.0000	0.0001	0.0002				0			
0.0001	0.0000		0.0001	0.0001	0.0006	0.0008	0.0004	0.0000		0.0004		3.48	
			0	0.0001	0.0003	0.0005				0			
0.0001	0.0000		0.0001	0.0001	0.0004	0.0006	0.0003	0.0000		0.0003		2.58	
			0	0.0001	0.0003	0.0004				0			
0.0001	0.0000		0.0001	0.0001	0.0004	0.0005	0.0002	0.0000		0.0002		2.15	
			0	0.0001	0.0001	0.0002				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0660
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0334	
			0	0.0000	0.0000	0.0000				0			
0.0002	0.0000		0.0002	0.0002	0.0008	0.0012	0.0005	0.0000		0.0005		4.65	
			0	0.0000	0.0001	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.1569
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0521	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0715	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.1872	
0.0001	0.0000		0.0001	0.0000	0.0002	0.0004	0.0001	0.0000		0.0001		1.22	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0614	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0107
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1725	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0320
0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2645	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0464
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.4420	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0811
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0604	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0002
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0114	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0000
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0156	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0000
			0	0.0001	0.0001	0.0002				0			
0.0000		0.0000	0.0000	0.0000	0.0002	0.0003	0.0002	0.0000	0.0000	0.0002	2.41		
0.0114	0.0001		0.0114	0.0036	0.0115	0.0265	0.0049	0.0004		0.0052		49.2	
			0	0.0010	0.0017	0.0027				0			
0.0171	0.0001		0.0172	0.0058	0.0175	0.0402	0.0071	0.0005		0.0076		71.3	
0.0066	0.0000		0.0066	0.0020	0.0064	0.0150	0.0026	0.0002		0.0028		26.2	
0.0001	0.0000		0.0001	0.0001	0.0002	0.0004	0.0001	0.0000		0.0001		0.8541	
			0	0.0000	0.0000	0.0000				0			
0.0003	0.0000		0.0003	0.0001	0.0005	0.0009	0.0002	0.0000		0.0002		2.03	
			0	0.0000	0.0001	0.0001				0			
0.0004	0.0000		0.0004	0.0002	0.0008	0.0014	0.0003	0.0000		0.0003		2.95	
			0	0.0000	0.0001	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0156
0.0001	0.0000		0.0001	0.0001	0.0004	0.0006	0.0002	0.0000		0.0002		1.59	
			0	0.0001	0.0002	0.0002				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001				0			0.2501
0.0001	0.0000		0.0001	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		0.9730	
			0	0.0001	0.0003	0.0004				0			
0.0000	0.0000		0.0000	0.0001	0.0006	0.0007				0			1.37
0.0000	0.0000		0.0001	0.0000	0.0001	0.0002	0.0001	0.0000		0.0001		0.5121	
			0	0.0000	0.0001	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0202
0.0003	0.0000		0.0003	0.0002	0.0005	0.0010	0.0002	0.0000		0.0003		2.39	
			0	0.0001	0.0002	0.0004				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0947
0.0007	0.0000		0.0007	0.0004	0.0015	0.0026	0.0007	0.0000		0.0007		6.68	
			0	0.0004	0.0008	0.0012				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001				0			0.2748
0.0062	0.0001		0.0062	0.0027	0.0089	0.0178	0.0036	0.0003		0.0039		36.5	
			0	0.0005	0.0009	0.0015				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0001				0			0.7115
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0972	
			0	0.0000	0.0000	0.0000				0			
			0	0.0000	0.0000	0.0000				0			
0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0097		
0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0005	
			0	0.0001	0.0003	0.0004				0			
0		0	0	0	0	0.0000	0		0	0	0.0000		
0.0000			0.0000	0.0000	0.0000	0.0000				0			0.0033

Group	Area	GAI	Sub-Area	Cal. Year	Season	Title	Veh_Tech	EMFAC2011 Category	Population	Total_VMT	cVMT	eVMT	Trips	TOG_RUNEX	TOG_IDLEX
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	All Other Buses-Dsl	All Other Buses - Dsl	77.5	3,451.8	3,451.8	0	690.0	0.0002	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	LDA-Dsl	LDA - Dsl	157.8	5,610.2	5,610.2	0	701.7	0.0000	
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	LDT1-Dsl	LDT1 - Dsl	0.1782	6.75	6.75	0	0.8214	0.0000	
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	LDT2-Dsl	LDT2 - Dsl	505.1	19,222.6	19,222.6	0	2,329.2	0.0004	
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	LHD1-Dsl	LHD1 - Dsl	3,313.5	104,706.5	104,706.5	0	41,679.7	0.0123	0.0005
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	LHD2-Dsl	LHD2 - Dsl	1,649.0	49,710.3	49,710.3	0	20,742.1	0.0073	0.0002
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	MDV-Dsl	MDV - Dsl	892.0	30,505.1	30,505.1	0	4,010.9	0.0003	
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	MH-Dsl	MH - Dsl	395.6	3,525.7	3,525.7	0	39.6	0.0004	
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	Motor Coach-Dsl	Motor Coach - Dsl	19.0	2,408.9	2,408.9	0	436.2	0.0000	0.0001
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	PTO-Dsl	PTO-Dsl	0	12,769.7	12,769.7	0		0.0002	
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	SBUS-Dsl	SBUS - Dsl	211.8	4,461.6	4,461.6	0	3,067.4	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 CAIRP Class 4-Dsl	T6 CAIRP small-Dsl	5.48	394.3	394.3	0	126.0	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 CAIRP Class 5-Dsl	T6 CAIRP small-Dsl	6.74	541.7	541.7	0	154.9	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 CAIRP Class 6-Dsl	T6 CAIRP small-Dsl	30.6	1,410.2	1,410.2	0	703.1	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 CAIRP Class 7-Dsl	T6 CAIRP heavy-Dsl	81.2	16,434.9	16,434.9	0	1,866.9	0.0001	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Instate Delivery Class 4-Dsl	T6 instate small-Dsl	165.5	5,458.9	5,458.9	0	2,362.3	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Instate Delivery Class 5-Dsl	T6 instate small-Dsl	107.8	3,554.5	3,554.5	0	1,538.3	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Instate Delivery Class 6-Dsl	T6 instate small-Dsl	467.7	15,422.3	15,422.3	0	6,674.6	0.0001	0.0001
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Instate Delivery Class 7-Dsl	T6 instate heavy-Dsl	116.3	5,893.7	5,893.7	0	1,659.6	0.0001	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Instate Other Class 4-Dsl	T6 instate small-Dsl	304.3	11,793.3	11,793.3	0	3,517.5	0.0001	0.0001
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Instate Other Class 5-Dsl	T6 instate small-Dsl	859.0	33,297.2	33,297.2	0	9,929.5	0.0002	0.0002
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Instate Other Class 6-Dsl	T6 instate small-Dsl	639.1	24,753.0	24,753.0	0	7,387.6	0.0002	0.0001
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Instate Other Class 7-Dsl	T6 instate heavy-Dsl	515.5	20,449.8	20,449.8	0	5,959.2	0.0002	0.0001
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Instate Tractor Class 6-Dsl	T6 instate small-Dsl	7.17	321.7	321.7	0	82.9	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Instate Tractor Class 7-Dsl	T6 instate heavy-Dsl	846.6	48,980.0	48,980.0	0	9,787.3	0.0004	0.0002
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 OOS Class 4-Dsl	T6 OOS small-Dsl	7.55	552.1	552.1	0	173.6	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 OOS Class 5-Dsl	T6 OOS small-Dsl	9.29	757.4	757.4	0	213.4	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 OOS Class 6-Dsl	T6 OOS small-Dsl	42.1	1,979.2	1,979.2	0	967.4	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 OOS Class 7-Dsl	T6 OOS heavy-Dsl	51.8	14,391.3	14,391.3	0	1,190.8	0.0001	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Public Class 4-Dsl	T6 Public-Dsl	15.6	534.3	534.3	0	79.8	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Public Class 5-Dsl	T6 Public-Dsl	43.6	1,495.1	1,495.1	0	223.6	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Public Class 6-Dsl	T6 Public-Dsl	67.2	2,301.8	2,301.8	0	344.8	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Public Class 7-Dsl	T6 Public-Dsl	94.3	3,946.3	3,946.3	0	483.8	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Utility Class 5-Dsl	T6 Utility-Dsl	14.7	583.6	583.6	0	187.5	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Utility Class 6-Dsl	T6 Utility-Dsl	2.77	110.3	110.3	0	35.5	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T6 Utility Class 7-Dsl	T6 Utility-Dsl	3.07	151.4	151.4	0	39.4	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 CAIRP Class 8-Dsl	T7 CAIRP-Dsl	1,743.9	363,673.4	363,673.4	0	40,074.1	0.0052	0.0228
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 NNOOS Class 8-Dsl	T7 NNOOS-Dsl	1,932.9	554,098.9	554,098.9	0	44,418.8	0.0077	0.0314
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 NOOS Class 8-Dsl	T7 NOOS-Dsl	831.9	201,294.3	201,294.3	0	19,116.2	0.0029	0.0135
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 Other Port Class 8-Dsl	T7 Other Port-Dsl	24.3	5,839.6	5,839.6	0	397.2	0.0001	0.0001
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 POAK Class 8-Dsl	T7 POAK-Dsl	124.6	14,452.3	14,452.3	0	2,039.0	0.0002	0.0005
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 POLA Class 8-Dsl	T7 POLA-Dsl	113.7	21,086.7	21,086.7	0	1,860.1	0.0003	0.0005
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 Public Class 8-Dsl	T7 Public-Dsl	240.7	9,691.7	9,691.7	0	1,234.6	0.0003	0.0004
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 SWCV Class 8-Dsl	T7 SWCV-Dsl	44.2	2,866.0	2,866.0	0	203.2	0.0001	0.0001
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 Single Concrete/Transit Mix Class 8-Dsl	T7 Single-Dsl	52.4	3,461.9	3,461.9	0	493.9	0.0000	0.0001
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 Single Dump Class 8-Dsl	T7 Single-Dsl	319.5	15,507.4	15,507.4	0	3,009.6	0.0002	0.0007
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 Single Other Class 8-Dsl	T7 Single-Dsl	1,225.6	43,098.0	43,098.0	0	11,545.0	0.0005	0.0029
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 Tractor Class 8-Dsl	T7 Tractor-Dsl	4,145.1	269,177.9	269,177.9	0	60,228.5	0.0034	0.0180
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	T7 Utility Class 8-Dsl	T7 Utility-Dsl	15.2	627.5	627.5	0	194.8	0.0000	0.0000
1	SJCOG		All Sub-Areas	2046	Annual	Areas-2046	UBUS-Dsl	UBUS - Dsl	0.2230	8.05	8.05	0	0.8919	0.0000	
								TOTALs	22,540.6	1,956,771.1	1,956,771.1	0.0	314,202.7	0.0	0.1

TOG_STREX	TOG_TOTEX	TOG_DIURN	TOG_HTSK	TOG_RUNLS	TOG_TOTAL	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_TOTEX	ROG_DIURN	ROG_HTSK	ROG_RUNLS	ROG_TOTAL	CO_RUNEX	CO_IDLEX
	0.0002				0.0002	0.0002	0.0000		0.0002				0.0002	0.0007	0.0002
	0.0000				0.0000	0.0000			0.0000				0.0000	0.0012	
	0.0000				0.0000	0.0000			0.0000				0.0000	0.0000	
	0.0004				0.0004	0.0004			0.0004				0.0004	0.0040	
	0.0127				0.0127	0.0108	0.0004		0.0112				0.0112	0.0280	0.0033
	0.0076				0.0076	0.0064	0.0002		0.0066				0.0066	0.0170	0.0017
	0.0003				0.0003	0.0002			0.0002				0.0002	0.0070	
	0.0004				0.0004	0.0003			0.0003				0.0003	0.0010	
	0.0001				0.0001	0.0000	0.0001		0.0001				0.0001	0.0001	0.0012
	0.0002				0.0002	0.0002			0.0002				0.0002	0.0025	
	0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0003	0.0016
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001
	0.0001				0.0001	0.0001	0.0000		0.0001				0.0001	0.0005	0.0002
	0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0003	0.0013
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0002	0.0008
	0.0002				0.0002	0.0001	0.0001		0.0002				0.0002	0.0009	0.0036
	0.0001				0.0001	0.0001	0.0000		0.0001				0.0001	0.0004	0.0009
	0.0001				0.0001	0.0001	0.0001		0.0001				0.0001	0.0005	0.0025
	0.0004				0.0004	0.0002	0.0002		0.0004				0.0004	0.0015	0.0072
	0.0003				0.0003	0.0001	0.0001		0.0003				0.0003	0.0011	0.0053
	0.0003				0.0003	0.0002	0.0001		0.0003				0.0003	0.0012	0.0043
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001
	0.0006				0.0006	0.0004	0.0002		0.0005				0.0005	0.0026	0.0071
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0001
	0.0001				0.0001	0.0001	0.0000		0.0001				0.0001	0.0005	0.0001
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0002
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0005
	0.0001				0.0001	0.0000	0.0000		0.0000				0.0000	0.0001	0.0008
	0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0002	0.0011
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000
	0.0280				0.0280	0.0046	0.0201		0.0246				0.0246	0.0155	0.2964
	0.0391				0.0391	0.0068	0.0276		0.0344				0.0344	0.0229	0.4077
	0.0164				0.0164	0.0025	0.0119		0.0144				0.0144	0.0086	0.1755
	0.0002				0.0002	0.0001	0.0001		0.0002				0.0002	0.0004	0.0014
	0.0007				0.0007	0.0002	0.0005		0.0006				0.0006	0.0010	0.0069
	0.0008				0.0008	0.0002	0.0004		0.0007				0.0007	0.0016	0.0063
	0.0007				0.0007	0.0003	0.0003		0.0006				0.0006	0.0015	0.0045
	0.0002				0.0002	0.0001	0.0001		0.0001				0.0001	0.0002	0.0008
	0.0002				0.0002	0.0000	0.0001		0.0001				0.0001	0.0002	0.0016
	0.0009				0.0009	0.0002	0.0007		0.0008				0.0008	0.0009	0.0097
	0.0034				0.0034	0.0005	0.0025		0.0030				0.0030	0.0023	0.0372
	0.0214				0.0214	0.0030	0.0158		0.0188				0.0188	0.0142	0.2333
	0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0002
	0.0000				0.0000	0.0000			0.0000				0.0000	0.0000	
0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	1.2

CO_STREX	CO_TOTEX	NOx_RUNEX	NOx_IDLEX	NOx_STREX	NOx_TOTEX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CO2_TOTEX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_TOTEX	PM10_PMTW	PM10_PMBW
	0.0008	0.0043	0.0002	0.0007	0.0052	3.92	0.0460		3.97	0.0000	0.0000		0.0000	0.0000	0.0002
	0.0012	0.0001			0.0001	1.12			1.12	0.0000			0.0000	0.0000	0.0001
	0.0000	0.0000			0.0000	0.0025			0.0025	0.0000			0.0000	0.0000	0.0000
	0.0040	0.0007			0.0007	5.31			5.31	0.0001			0.0001	0.0002	0.0002
	0.0313	0.0385	0.0041		0.0426	69.1	0.4273		69.5	0.0024	0.0001		0.0025	0.0014	0.0090
	0.0187	0.0267	0.0022		0.0289	38.4	0.3480		38.8	0.0014	0.0000		0.0015	0.0007	0.0050
	0.0070	0.0004			0.0004	11.0			11.0	0.0000			0.0000	0.0003	0.0004
	0.0010	0.0101			0.0101	4.20			4.20	0.0001			0.0001	0.0001	0.0002
	0.0013	0.0025	0.0004	0.0005	0.0034	4.03	0.1731		4.20	0.0001	0.0000		0.0001	0.0000	0.0002
	0.0025	0.0350			0.0350	24.2			24.2	0.0001			0.0001		
	0.0019	0.0018	0.0014	0.0020	0.0052	5.04	0.4293		5.47	0.0000	0.0000		0.0000	0.0001	0.0002
	0.0000	0.0001	0.0000	0.0000	0.0001	0.4375	0.0031		0.4406	0.0000	0.0000		0.0000	0.0000	0.0000
	0.0000	0.0001	0.0000	0.0001	0.0002	0.6012	0.0038		0.6050	0.0000	0.0000		0.0000	0.0000	0.0000
	0.0001	0.0003	0.0001	0.0003	0.0006	1.56	0.0171		1.58	0.0000	0.0000		0.0000	0.0000	0.0001
	0.0007	0.0035	0.0002	0.0008	0.0044	16.1	0.0446		16.1	0.0001	0.0000		0.0001	0.0002	0.0008
	0.0016	0.0021	0.0010	0.0027	0.0059	6.24	0.3176		6.55	0.0000	0.0000		0.0000	0.0001	0.0003
	0.0010	0.0014	0.0007	0.0018	0.0038	4.06	0.2069		4.27	0.0000	0.0000		0.0000	0.0000	0.0002
	0.0045	0.0061	0.0030	0.0076	0.0166	17.6	0.8976		18.5	0.0000	0.0000		0.0000	0.0002	0.0008
	0.0013	0.0036	0.0010	0.0024	0.0070	6.91	0.2331		7.14	0.0000	0.0000		0.0000	0.0001	0.0003
	0.0031	0.0035	0.0020	0.0045	0.0100	13.1	0.6279		13.7	0.0000	0.0000		0.0000	0.0002	0.0006
	0.0087	0.0097	0.0058	0.0128	0.0284	36.9	1.77		38.6	0.0001	0.0000		0.0001	0.0004	0.0016
	0.0065	0.0074	0.0043	0.0095	0.0212	27.4	1.32		28.7	0.0001	0.0000		0.0001	0.0003	0.0012
	0.0055	0.0102	0.0045	0.0097	0.0244	22.8	1.12		23.9	0.0001	0.0000		0.0001	0.0003	0.0010
	0.0001	0.0001	0.0000	0.0001	0.0002	0.3560	0.0148		0.3708	0.0000	0.0000		0.0000	0.0000	0.0000
	0.0097	0.0204	0.0071	0.0150	0.0425	49.9	1.79		51.7	0.0002	0.0000		0.0002	0.0006	0.0024
	0.0000	0.0001	0.0000	0.0001	0.0003	0.5751	0.0040		0.5791	0.0000	0.0000		0.0000	0.0000	0.0000
	0.0000	0.0002	0.0000	0.0001	0.0004	0.7895	0.0049		0.7944	0.0000	0.0000		0.0000	0.0000	0.0000
	0.0002	0.0005	0.0001	0.0006	0.0012	2.06	0.0222		2.08	0.0000	0.0000		0.0000	0.0000	0.0001
	0.0006	0.0037	0.0002	0.0008	0.0046	13.5	0.0272		13.5	0.0001	0.0000		0.0001	0.0002	0.0007
	0.0002	0.0004	0.0002	0.0001	0.0007	0.6351	0.0473		0.6824	0.0000	0.0000		0.0000	0.0000	0.0000
	0.0006	0.0009	0.0005	0.0003	0.0017	1.78	0.1338		1.92	0.0000	0.0000		0.0000	0.0000	0.0001
	0.0009	0.0011	0.0008	0.0005	0.0024	2.73	0.2044		2.94	0.0000	0.0000		0.0000	0.0000	0.0001
	0.0013	0.0017	0.0012	0.0008	0.0036	4.63	0.2808		4.91	0.0000	0.0000		0.0000	0.0001	0.0002
	0.0001	0.0001	0.0001	0.0002	0.0004	0.6488	0.0225		0.6714	0.0000	0.0000		0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0001	0.1226	0.0043		0.1269	0.0000	0.0000		0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0001	0.1684	0.0047		0.1732	0.0000	0.0000		0.0000	0.0000	0.0000
	0.3118	0.4820	0.1537	0.0695	0.7051	508.6	38.3		546.9	0.0119	0.0001		0.0120	0.0144	0.0328
	0.4306	0.8117	0.3261	0.1163	1.25	741.8	50.5		792.4	0.0179	0.0001		0.0180	0.0220	0.0500
	0.1841	0.3033	0.1403	0.0501	0.4937	269.4	21.7		291.1	0.0069	0.0001		0.0069	0.0080	0.0182
	0.0018	0.0080	0.0008	0.0008	0.0095	8.76	0.1733		8.93	0.0001	0.0000		0.0001	0.0002	0.0006
	0.0080	0.0205	0.0039	0.0041	0.0285	21.6	0.8900		22.5	0.0003	0.0000		0.0003	0.0006	0.0015
	0.0079	0.0323	0.0038	0.0040	0.0402	31.9	0.8230		32.7	0.0004	0.0000		0.0004	0.0008	0.0022
	0.0060	0.0191	0.0033	0.0071	0.0295	17.0	0.6756		17.7	0.0001	0.0000		0.0001	0.0004	0.0011
	0.0010	0.0062	0.0009	0.0010	0.0081	10.7	0.1490		10.8	0.0001	0.0000		0.0001	0.0001	0.0007
	0.0018	0.0031	0.0008	0.0013	0.0051	5.48	0.2103		5.69	0.0001	0.0000		0.0001	0.0001	0.0003
	0.0106	0.0185	0.0052	0.0087	0.0324	25.2	1.36		26.6	0.0003	0.0000		0.0003	0.0006	0.0015
	0.0395	0.0465	0.0196	0.0327	0.0988	69.2	5.06		74.3	0.0008	0.0000		0.0008	0.0017	0.0042
	0.2475	0.3496	0.1403	0.2227	0.7126	375.3	30.3		405.6	0.0064	0.0001		0.0065	0.0107	0.0255
	0.0002	0.0007	0.0001	0.0009	0.0017	1.06	0.0222		1.08	0.0000	0.0000		0.0000	0.0000	0.0001
	0.0000	0.0000			0.0000	0.0058			0.0058	0.0000			0.0000	0.0000	0.0000
0.0	1.4	2.3	0.8	0.6	3.7	2,484.0	160.8	0.0	2,644.8	0.1	0.0	0.0	0.1	0.1	0.2

PM10_TOTAL	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_TOTEX	PM2_5_PMTW	PM2_5_PMBW	PM2_5_TOTAL	SOx_RUNEX	SOx_IDLEX	SOx_STREX	SOx_TOTEX	Fuel_GAS	Fuel_DSL	Fuel_NG
0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3570	
0.0001	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.1009	
0.0000	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0002	
0.0005	0.0001			0.0001	0.0000	0.0001	0.0002	0.0001			0.0001		0.4779	
0.0128	0.0023	0.0001		0.0023	0.0003	0.0032	0.0058	0.0007	0.0000		0.0007		6.26	
0.0071	0.0014	0.0000		0.0014	0.0002	0.0017	0.0033	0.0004	0.0000		0.0004		3.49	
0.0007	0.0000			0.0000	0.0001	0.0001	0.0002	0.0001			0.0001		0.9899	
0.0004	0.0001			0.0001	0.0000	0.0001	0.0002	0.0000			0.0000		0.3782	
0.0003	0.0001	0.0000		0.0001	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3782	
0.0001	0.0001			0.0001			0.0001	0.0002			0.0002		2.18	
0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0001		0.4924	
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0397	
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0545	
0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1422	
0.0011	0.0001	0.0000		0.0001	0.0001	0.0003	0.0004	0.0002	0.0000		0.0002		1.45	
0.0004	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.5898	
0.0002	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3844	
0.0010	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004	0.0002	0.0000		0.0002		1.67	
0.0004	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.6429	
0.0008	0.0000	0.0000		0.0000	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		1.23	
0.0022	0.0001	0.0000		0.0001	0.0001	0.0006	0.0008	0.0004	0.0000		0.0004		3.48	
0.0016	0.0001	0.0000		0.0001	0.0001	0.0004	0.0006	0.0003	0.0000		0.0003		2.58	
0.0014	0.0001	0.0000		0.0001	0.0001	0.0004	0.0005	0.0002	0.0000		0.0002		2.15	
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0334	
0.0033	0.0002	0.0000		0.0002	0.0002	0.0008	0.0012	0.0005	0.0000		0.0005		4.65	
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0521	
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0715	
0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.1872	
0.0010	0.0001	0.0000		0.0001	0.0000	0.0002	0.0004	0.0001	0.0000		0.0001		1.22	
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0614	
0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1725	
0.0002	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2645	
0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.4420	
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0604	
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0114	
0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0156	
0.0592	0.0114	0.0001		0.0114	0.0036	0.0115	0.0265	0.0049	0.0004		0.0052		49.2	
0.0900	0.0171	0.0001		0.0172	0.0055	0.0175	0.0402	0.0071	0.0005		0.0076		71.3	
0.0331	0.0066	0.0000		0.0066	0.0020	0.0064	0.0150	0.0026	0.0002		0.0028		26.2	
0.0009	0.0001	0.0000		0.0001	0.0001	0.0002	0.0004	0.0001	0.0000		0.0001		0.8041	
0.0023	0.0003	0.0000		0.0003	0.0001	0.0005	0.0009	0.0002	0.0000		0.0002		2.03	
0.0034	0.0004	0.0000		0.0004	0.0002	0.0008	0.0014	0.0003	0.0000		0.0003		2.95	
0.0016	0.0001	0.0000		0.0001	0.0001	0.0004	0.0006	0.0002	0.0000		0.0002		1.59	
0.0008	0.0001	0.0000		0.0001	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		0.9730	
0.0005	0.0000	0.0000		0.0001	0.0000	0.0001	0.0002	0.0001	0.0000		0.0001		0.5121	
0.0024	0.0003	0.0000		0.0003	0.0002	0.0005	0.0010	0.0002	0.0000		0.0003		2.39	
0.0067	0.0007	0.0000		0.0007	0.0004	0.0015	0.0026	0.0007	0.0000		0.0007		6.68	
0.0427	0.0062	0.0001		0.0062	0.0027	0.0089	0.0178	0.0036	0.0003		0.0039		36.5	
0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0972	
0.0000	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0005	
0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	238.0	0.0

EMFAC2011 Category	Population	Total_VMT	cVMT	eVMT	Trips	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_TOTEX	TOG_DIURN	TOG_HTSK	TOG_RUNLS	TOG_TOTAL
All Vehicles	593,453.0	23,397,883.0	20,701,037.4	2,696,845.6	3,086,450.0	0.2454	0.1066	0.4281	0.7801	0.6685	0.1907	0.5542	2.19
All Other Buses - Dsl	78.1	3,478.1	3,478.1	0	695.2	0.0002	0.0000		0.0002				0.0002
All Other Buses - Oth	6.10	256.0	256.0	0	54.3	0.0002	0.0000		0.0003				0.0003
LDA - Dsl	159.0	5,653.0	5,653.0	0	707.1	0.0000			0.0000				0.0000
LDA - Oth	33,576.0	1,263,508.6	0	1,263,508.6	156,744.0				0				0
LDA - Gas	246,464.0	9,697,748.7	9,697,748.7	0	1,137,722.6	0.0502		0.1672	0.2175	0.2772	0.0498	0.2072	0.7517
LDA - Gas	11,579.9	457,736.7	186,845.2	270,891.5	47,883.0	0.0010		0.0098	0.0109	0.0123	0.0022	0.0048	0.0302
LDT1 - Dsl	0.1795	6.80	6.80	0	0.8277	0.0000			0.0000				0.0000
LDT1 - Oth	460.8	17,487.4	0	17,487.4	2,158.1				0				0
LDT1 - Gas	15,957.1	574,249.9	574,249.9	0	71,902.9	0.0032		0.0115	0.0148	0.0253	0.0042	0.0187	0.0630
LDT1 - Gas	354.0	13,898.5	5,657.7	8,240.8	1,463.8	0.0000		0.0003	0.0003	0.0003	0.0001	0.0001	0.0008
LDT2 - Dsl	508.9	19,369.2	19,369.2	0	2,347.0	0.0004			0.0004				0.0004
LDT2 - Oth	5,266.0	138,102.5	0	138,102.5	24,650.2				0				0
LDT2 - Gas	134,871.6	5,077,533.3	5,077,533.3	0	618,638.6	0.0364		0.1217	0.1581	0.1674	0.0289	0.1250	0.4795
LDT2 - Gas	3,626.7	139,601.3	56,926.5	82,674.8	14,996.4	0.0003		0.0031	0.0034	0.0035	0.0006	0.0013	0.0088
LHD1 - Dsl	3,338.8	105,505.2	105,505.2	0	41,997.7	0.0124	0.0005		0.0128				0.0128
LHD1 - Oth	5,331.1	223,195.9	0	223,195.9	75,016.7				0				0
LHD1 - Gas	5,086.0	170,245.0	170,245.0	0	75,773.1	0.0011	0.0023	0.0079	0.0114	0.0128	0.0018	0.0173	0.0433
LHD2 - Dsl	1,661.6	50,089.5	50,089.5	0	20,900.4	0.0074	0.0002		0.0076				0.0076
LHD2 - Oth	1,240.8	50,741.7	0	50,741.7	16,420.4				0				0
LHD2 - Gas	535.1	17,641.7	17,641.7	0	7,972.4	0.0001	0.0002	0.0007	0.0010	0.0014	0.0002	0.0019	0.0046
MCY - Gas	10,378.5	54,272.1	54,272.1	0	20,756.9	0.0650		0.0230	0.0880	0.0449	0.0818	0.0890	0.3037
MDV - Dsl	898.8	30,737.8	30,737.8	0	4,041.5	0.0003			0.0003				0.0003
MDV - Oth	4,882.6	126,565.7	0	126,565.7	22,761.6				0				0
MDV - Gas	80,345.9	2,806,907.2	2,806,907.2	0	363,975.6	0.0219		0.0792	0.1011	0.1182	0.0201	0.0861	0.3255
MDV - Gas	2,319.6	84,200.3	34,350.8	49,849.5	9,591.5	0.0002		0.0020	0.0022	0.0024	0.0004	0.0009	0.0059
MH - Dsl	398.6	3,552.5	3,552.5	0	39.9	0.0004			0.0004				0.0004
MH - Gas	599.7	6,187.7	6,187.7	0	60.0	0.0001		0.0000	0.0001	0.0014	0.0002	0.0000	0.0017
Motor Coach - Dsl	19.1	2,427.3	2,427.3	0	439.5	0.0000	0.0001		0.0001				0.0001
OBUS - Oth	42.3	2,898.4	0	2,898.4	846.0				0				0
OBUS - Gas	68.7	2,422.3	2,422.3	0	1,375.4	0.0001	0.0001	0.0003	0.0004	0.0003	0.0000	0.0003	0.0011
PTO-Dsl	0	12,867.1	12,867.1	0		0.0002			0.0002				0.0002
PTO-Oth	0	12,809.9	0	12,809.9					0				0
SBUS - Dsl	213.5	4,495.7	4,495.7	0	3,090.8	0.0000	0.0000		0.0001				0.0001
SBUS - Oth	28.2	6,815.8	0	6,815.8	3,246.5				0				0
SBUS - Gas	85.0	4,514.3	4,514.3	0	340.1	0.0001	0.0015	0.0002	0.0017	0.0005	0.0001	0.0003	0.0026
SBUS-Oth	71.1	1,463.7	1,463.7	0	1,029.9	0.0038	0.0010		0.0048				0.0048
T6 CAIRP small-Dsl	5.53	397.4	397.4	0	127.0	0.0000	0.0000		0.0000				0.0000
T6 CAIRP small-Oth	7.54	574.4	0	574.4	173.4				0				0
T6 CAIRP small-Dsl	6.79	545.9	545.9	0	156.1	0.0000	0.0000		0.0000				0.0000
T6 CAIRP small-Oth	9.24	787.1	0	787.1	212.4				0				0
T6 CAIRP small-Dsl	30.8	1,420.9	1,420.9	0	708.5	0.0000	0.0000		0.0000				0.0000
T6 CAIRP small-Oth	42.4	2,062.3	0	2,062.3	973.4				0				0
T6 CAIRP heavy-Dsl	81.9	16,560.2	16,560.2	0	1,881.1	0.0001	0.0000		0.0001				0.0001
T6 CAIRP heavy-Oth	25.2	5,288.3	0	5,288.3	578.6				0				0
T6 instate small-Dsl	166.8	5,500.5	5,500.5	0	2,380.3	0.0000	0.0000		0.0001				0.0001
T6 instate small-Oth	177.0	6,241.5	0	6,241.5	2,525.9				0				0
T6 instate small-Dsl	108.6	3,581.6	3,581.6	0	1,550.0	0.0000	0.0000		0.0000				0.0000
T6 instate small-Oth	114.9	4,056.0	0	4,056.0	1,640.2				0				0
T6 instate small-Dsl	471.3	15,540.0	15,540.0	0	6,725.5	0.0001	0.0001		0.0002				0.0002
T6 instate small-Oth	499.1	17,605.8	0	17,605.8	7,122.6				0				0
T6 instate heavy-Dsl	117.2	5,938.6	5,938.6	0	1,672.3	0.0001	0.0000		0.0001				0.0001
T6 instate heavy-Oth	70.9	3,810.6	0	3,810.6	1,011.6				0				0
T6 instate heavy-NG	4.19	207.3	207.3	0	59.9	0.0002	0.0001		0.0003				0.0003
T6 instate small-Dsl	306.6	11,883.2	11,883.2	0	3,544.4	0.0001	0.0001		0.0001				0.0001
T6 instate small-Oth	324.5	14,213.1	0	14,213.1	3,750.8				0				0
T6 instate small-Dsl	865.5	33,551.2	33,551.2	0	10,005.2	0.0002	0.0002		0.0004				0.0004
T6 instate small-Oth	914.8	40,127.6	0	40,127.6	10,575.1				0				0
T6 instate small-Dsl	643.9	24,941.8	24,941.8	0	7,444.0	0.0002	0.0001		0.0003				0.0003
T6 instate small-Oth	679.6	29,782.2	0	29,782.2	7,856.2				0				0
T6 instate heavy-Dsl	519.4	20,605.7	20,605.7	0	6,004.6	0.0002	0.0001		0.0003				0.0003
T6 instate heavy-Oth	301.2	16,183.6	0	16,183.6	3,481.5				0				0
T6 instate heavy-NG	13.0	512.1	512.1	0	150.7	0.0004	0.0002		0.0006				0.0006
T6 instate small-Dsl	7.23	324.1	324.1	0	83.5	0.0000	0.0000		0.0000				0.0000
T6 instate small-Oth	7.63	400.4	0	400.4	88.2				0				0
T6 instate heavy-Dsl	853.1	49,353.6	49,353.6	0	9,861.9	0.0004	0.0002		0.0006				0.0006
T6 instate heavy-Oth	170.7	11,891.1	0	11,891.1	1,973.1				0				0
T6 instate heavy-NG	22.7	1,286.2	1,286.2	0	262.4	0.0010	0.0003		0.0013				0.0013
T6 OOS small-Dsl	7.61	556.4	556.4	0	174.9	0.0000	0.0000		0.0000				0.0000
T6 OOS small-Dsl	9.36	763.2	763.2	0	215.0	0.0000	0.0000		0.0000				0.0000
T6 OOS small-Dsl	42.4	1,994.3	1,994.3	0	974.8	0.0000	0.0000		0.0000				0.0000
T6 OOS heavy-Dsl	52.2	14,501.1	14,501.1	0	1,199.9	0.0001	0.0000		0.0001				0.0001
T6 Public-Dsl	15.7	538.4	538.4	0	80.4	0.0000	0.0000		0.0000				0.0000
T6 Public-Oth	14.4	565.2	0	565.2	73.6				0				0
T6 Public-NG	2.09	72.4	72.4	0	10.7	0.0001	0.0000		0.0001				0.0001
T6 Public-Dsl	43.9	1,506.5	1,506.5	0	225.3	0.0000	0.0000		0.0000				0.0000
T6 Public-Oth	40.0	1,572.7	0	1,572.7	205.3				0				0
T6 Public-NG	6.31	215.7	215.7	0	32.4	0.0002	0.0001		0.0003				0.0003
T6 Public-Dsl	67.7	2,319.4	2,319.4	0	347.4	0.0000	0.0000		0.0001				0.0001
T6 Public-Oth	61.3	2,398.0	0	2,398.0	314.5				0				0
T6 Public-NG	9.06	312.9	312.9	0	46.5	0.0003	0.0002		0.0005				0.0005
T6 Public-Dsl	95.0	3,976.4	3,976.4	0	487.5	0.0000	0.0000		0.0001				0.0001
T6 Public-Oth	68.8	3,301.7	0	3,301.7	352.9				0				0
T6 Public-NG	13.5	562.6	562.6	0	69.1	0.0006	0.0003		0.0008				0.0008
T6 Utility-Dsl	14.8	588.0	588.0	0	189.0	0.0000	0.0000		0.0000				0.0000
T6 Utility-Oth	21.0	864.6	0	864.6	269.0				0				0
T6 Utility-NG	0.0333	1.33	1.33	0	0.4266	0.0000	0.0000		0.0000				0.0000
T6 Utility-Dsl	2.79	111.1	111.1	0	35.7	0.0000	0.0000		0.0000				0.0000
T6 Utility-Oth	3.97	163.4	0	163.4	50.8				0				0
T6 Utility-NG	0.0063	0.2509	0.2509	0	0.0806	0.0000	0.0000		0.0000				0.0000
T6 Utility-Dsl	3.10	152.5	152.5	0	39.7	0.0000	0.0000		0.0000				0.0000
T6 Utility-Oth	4.41	229.4	0	229.4	56.5				0				0
T6 Utility-NG	0.0070	0.3443	0.3443	0	0.0895	0.0000	0.0000		0.0000				0.0000
T6TS - Gas	241.7	16,213.6	0	16,213.6	4,836.3				0				0
T6TS - Gas	263.8	13,378.6	13,378.6	0	5,277.3	0.0002	0.0004	0.0012	0.0018	0.0006	0.0001	0.0012	0.0037
T7 CAIRP-Dsl	1,757.2	366,447.5	366,447.5	0	40,379.8	0.0052	0.0230		0.0283				0.0283
T7 CAIRP-Oth	489.3	105,786.0	0	105,786.0	11,244.5				0				0
T7 NNOOS-Dsl	1,947.7	558,325.6	558,325.6	0	44,757.6	0.0078	0.0317		0.0394				0.0394
T7 NOOS-Dsl	838.2	202,829.8	202,829.8	0	19,262.0	0.0029	0.0136		0.0165				0.0165
T7 Other Port-Dsl	24.5	5,884.1	5,884.1	0	400.2	0.0001	0.0001		0.0002				0.0002
T7 Other Port-Oth	5.65	1,489.4	0	1,489.4	92.5				0				0
T7 POAK-Dsl	125.6	14,562.6	14,562.6	0	2,054.5	0.0002	0.0005		0.0007				0.0007
T7 POAK-Oth	29.2	3,353.1	0	3,353.1	478.5				0				0
T7 POLA-Dsl	114.6	21,247.5	21,247.5	0	1,874.3	0.0003	0.0005		0.0008				0.0008
T7 POLA-Oth	20.8	3,819.0	0	3,819.0	340.7				0				0
T7 POLA-NG	0.5377	99.7	99.7	0	8.80	0.0001	0.0000		0.0002				0.0002
T7 Public-Dsl	242.5	9,765.6	9,765.6	0	1,244.0	0.0003	0.0004		0.0007				0.0007
T7 Public-Oth	168.7	7,946.8	0	7,946.8	865.5				0				0
T7 Public-NG	30.6	1,236.6	1,236.6	0	156.9	0.0024	0.0006		0.0030				0.0030
T7 SWCV-Dsl	44.5	2,887.8	2,887.8	0	204.7	0.0001	0.0001		0.0002				0.0002
T7 SWCV-Oth	116.4	7,531.9	0	7,531.9	535.4				0				0
T7 SWCV-NG	117.9	7,639.1	7,639.1	0	542.3	0.0041	0.0004		0.0046				0.0046
T7 Single-Dsl	52.8	3,488.3	3,488.3	0	497.7	0.0000	0.0001		0.0002				0.0002
Single Concrete/Transit Mix	67.9	4,838.8	0	4,838.8	639.2				0				0
T7 Single-NG	1.92	127.0	127.0	0	18.1	0.0002	0.0001		0.0002				0.0002
T7 Single-Dsl	321.9	15,625.7	15,625.7	0	3,032.6	0.0002	0.0008		0.0010				0.0010
T7 Single Dump-Oth	226.7	14,325.1	0	14,325.1	2,135.8				0				0
T7 Single-NG	11.5	562.1	562.1	0	108.4	0.0007	0.0004		0.0010				0.0010
T7 Single-Dsl	1,234.9	43,426.8	43,426.8	0	11,633.1	0.0005	0.0029		0.0034				0.0034
T7 Single Other-Oth	1,034.5	45,349.3	0	45,349.3	9,744.5				0				0
T7 Single-NG	44.5	1,571.4	1,571.4	0	419.1	0.0019	0.0013		0.0032				0.0032
T7 Tractor-Dsl	4,176.7	271,231.2	271,231.2	0	60,687.9	0.0035	0.0181		0.0216				0.0216
T7 Tractor-Oth	765.6	54,965.4	0	54,965.4	11,123.6				0				0
T7 Tractor-NG	65.6	4,253.0	4,253.0	0	953.1	0.0049	0.0036		0.0085				0.0085
T7 Utility-Dsl	15.3	632.3	632.3	0	196.3	0.0000	0.0000		0.0000				0.0000
T7 Utility-Oth	10.9	515.8	0	515.8	139.1				0				0
T7IS - Gas	0.3221	51.9	0	51.9	6.44				0				0
T7IS - Gas	0.3690	46.2	46.2	0	7.38	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
UBUS - Dsl	0.2247	8.11	8.11	0	0.8988	0.0000			0.0000				0.0000
UBUS - Oth	219.0	14,758.2	0	14,758.2	876.1				0				0
UBUS - Gas	0.0000	0.0026	0.0026	0	0.0001	0		0	0	0	0	0	0
UBUS - NG	0.9052	32.7	32.7	0	3.62	0.0000			0.0000				0.0000

EMFAC2011 Category	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_TOTEX	ROG_DIURN	ROG_HTSK	ROG_RUNLS	ROG_TOTAL	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	NOx_RUNEX
All Vehicles	0.1701	0.0854	0.3912	0.6467	0.6685	0.1907	0.5542	2.06	13.0	1.30	5.11	19.4	2.80
All Other Buses - Dsl	0.0002	0.0000		0.0002				0.0002	0.0007	0.0002		0.0008	0.0044
All Other Buses - Oth	0.0000	0.0000		0.0000				0.0000	0.0010	0.0001		0.0010	0.0000
LDA - Dsl	0.0000			0.0000				0.0000	0.0012			0.0012	0.0001
LDA - Oth				0				0				0	
LDA - Gas	0.0344		0.1527	0.1872	0.2772	0.0498	0.2072	0.7214	5.83		2.05	7.88	0.2173
LDA - Gas	0.0007		0.0090	0.0097	0.0123	0.0022	0.0048	0.0290	0.1058		0.0691	0.1749	0.0015
LDT1 - Dsl	0.0000			0.0000				0.0000	0.0000			0.0000	0.0000
LDT1 - Oth				0				0				0	
LDT1 - Gas	0.0022		0.0105	0.0128	0.0253	0.0042	0.0187	0.0610	0.3645		0.1365	0.5010	0.0138
LDT1 - Gas	0.0000		0.0003	0.0003	0.0003	0.0001	0.0001	0.0008	0.0032		0.0021	0.0053	0.0000
LDT2 - Dsl	0.0004			0.0004				0.0004	0.0041			0.0041	0.0007
LDT2 - Oth				0				0				0	
LDT2 - Gas	0.0250		0.1111	0.1361	0.1674	0.0289	0.1250	0.4575	3.56		1.43	4.99	0.1297
LDT2 - Gas	0.0002		0.0028	0.0030	0.0035	0.0006	0.0013	0.0084	0.0322		0.0217	0.0539	0.0005
LHD1 - Dsl	0.0109	0.0004		0.0113				0.0113	0.0282	0.0033		0.0315	0.0388
LHD1 - Oth				0				0				0	
LHD1 - Gas	0.0008	0.0016	0.0072	0.0096	0.0128	0.0018	0.0173	0.0416	0.1118	0.0212	0.2727	0.4057	0.0036
LHD2 - Dsl	0.0065	0.0002		0.0067				0.0067	0.0172	0.0017		0.0188	0.0269
LHD2 - Oth				0				0				0	
LHD2 - Gas	0.0001	0.0001	0.0007	0.0009	0.0014	0.0002	0.0019	0.0044	0.0117	0.0022	0.0292	0.0432	0.0004
MCY - Gas	0.0520		0.0211	0.0732	0.0449	0.0818	0.0890	0.2889	0.6359		0.1766	0.8125	0.0286
MDV - Dsl	0.0002			0.0002				0.0002	0.0071			0.0071	0.0005
MDV - Oth				0				0				0	
MDV - Gas	0.0150		0.0723	0.0874	0.1182	0.0201	0.0861	0.3118	2.06		0.8756	2.93	0.0790
MDV - Gas	0.0001		0.0018	0.0019	0.0024	0.0004	0.0009	0.0056	0.0195		0.0138	0.0333	0.0003
MH - Dsl	0.0003			0.0003				0.0003	0.0010			0.0010	0.0102
MH - Gas	0.0001		0.0000	0.0001	0.0014	0.0002	0.0000	0.0017	0.0011		0.0002	0.0013	0.0014
Motor Coach - Dsl	0.0000	0.0001		0.0001				0.0001	0.0001	0.0012		0.0013	0.0025
OBUS - Oth				0				0				0	
OBUS - Gas	0.0001	0.0001	0.0003	0.0004	0.0003	0.0000	0.0003	0.0010	0.0011	0.0004	0.0047	0.0063	0.0008
PTO-Dsl	0.0002			0.0002				0.0002	0.0025			0.0025	0.0353
PTO-Oth				0				0				0	
SBUS - Dsl	0.0000	0.0000		0.0001				0.0001	0.0003	0.0017		0.0019	0.0018
SBUS - Oth				0				0				0	
SBUS - Gas	0.0000	0.0010	0.0001	0.0012	0.0005	0.0001	0.0003	0.0021	0.0010	0.0077	0.0031	0.0118	0.0008
SBUS-Oth	0.0001	0.0000		0.0001				0.0001	0.0103	0.0027		0.0130	0.0003
T6 CAIRP small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0001
T6 CAIRP small-Oth				0				0				0	
T6 CAIRP small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0001
T6 CAIRP small-Oth				0				0				0	
T6 CAIRP small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0003
T6 CAIRP small-Oth				0				0				0	
T6 CAIRP heavy-Dsl	0.0001	0.0000		0.0001				0.0001	0.0005	0.0002		0.0007	0.0035
T6 CAIRP heavy-Oth				0				0				0	
T6 instate small-Dsl	0.0000	0.0000		0.0001				0.0001	0.0003	0.0013		0.0016	0.0022
T6 instate small-Oth				0				0				0	
T6 instate small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0002	0.0008		0.0011	0.0014
T6 instate small-Oth				0				0				0	
T6 instate small-Dsl	0.0001	0.0001		0.0002				0.0002	0.0009	0.0037		0.0046	0.0061
T6 instate small-Oth				0				0				0	
T6 instate heavy-Dsl	0.0001	0.0000		0.0001				0.0001	0.0004	0.0009		0.0013	0.0037
T6 instate heavy-Oth				0				0				0	
T6 instate heavy-NG	0.0000	0.0000		0.0000				0.0000	0.0009	0.0002		0.0010	0.0000
T6 instate small-Dsl	0.0001	0.0001		0.0001				0.0001	0.0005	0.0026		0.0031	0.0035
T6 instate small-Oth				0				0				0	
T6 instate small-Dsl	0.0002	0.0002		0.0004				0.0004	0.0016	0.0072		0.0088	0.0098
T6 instate small-Oth				0				0				0	
T6 instate small-Dsl	0.0001	0.0001		0.0003				0.0003	0.0012	0.0054		0.0065	0.0074
T6 instate small-Oth				0				0				0	
T6 instate heavy-Dsl	0.0002	0.0001		0.0003				0.0003	0.0012	0.0043		0.0055	0.0103
T6 instate heavy-Oth				0				0				0	
T6 instate heavy-NG	0.0000	0.0000		0.0000				0.0000	0.0015	0.0006		0.0021	0.0000
T6 instate small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0001
T6 instate small-Oth				0				0				0	
T6 instate heavy-Dsl	0.0004	0.0002		0.0005				0.0005	0.0027	0.0071		0.0098	0.0206
T6 instate heavy-Oth				0				0				0	
T6 instate heavy-NG	0.0000	0.0000		0.0000				0.0000	0.0038	0.0010		0.0048	0.0001
T6 OOS small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0001
T6 OOS small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0002
T6 OOS small-Dsl	0.0000	0.0000		0.0000				0.0000	0.0001	0.0001		0.0002	0.0005
T6 OOS heavy-Dsl	0.0001	0.0000		0.0001				0.0001	0.0005	0.0001		0.0006	0.0037
T6 Public-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0002		0.0002	0.0004
T6 Public-Oth				0				0				0	
T6 Public-NG	0.0000	0.0000		0.0000				0.0000	0.0002	0.0001		0.0004	0.0000
T6 Public-Dsl	0.0000	0.0000		0.0000				0.0000	0.0001	0.0005		0.0006	0.0009
T6 Public-Oth				0				0				0	
T6 Public-NG	0.0000	0.0000		0.0000				0.0000	0.0007	0.0004		0.0011	0.0000
T6 Public-Dsl	0.0000	0.0000		0.0000				0.0000	0.0001	0.0008		0.0009	0.0011
T6 Public-Oth				0				0				0	
T6 Public-NG	0.0000	0.0000		0.0000				0.0000	0.0011	0.0006		0.0016	0.0000
T6 Public-Dsl	0.0000	0.0000		0.0001				0.0001	0.0002	0.0011		0.0013	0.0017
T6 Public-Oth				0				0				0	
T6 Public-NG	0.0000	0.0000		0.0000				0.0000	0.0019	0.0008		0.0027	0.0000
T6 Utility-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0001
T6 Utility-Oth				0				0				0	
T6 Utility-NG	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000
T6 Utility-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000
T6 Utility-Oth				0				0				0	
T6 Utility-NG	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000
T6 Utility-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000
T6 Utility-Oth				0				0				0	
T6 Utility-NG	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000
T6TS - Gas				0				0				0	
T6TS - Gas	0.0002	0.0003	0.0011	0.0015	0.0006	0.0001	0.0012	0.0033	0.0027	0.0044	0.0200	0.0271	0.0010
T7 CAIRP-Dsl	0.0046	0.0202		0.0248				0.0248	0.0156	0.2986		0.3142	0.4856
T7 CAIRP-Oth				0				0				0	
T7 NNOOS-Dsl	0.0068	0.0278		0.0346				0.0346	0.0231	0.4108		0.4339	0.8179
T7 NOOS-Dsl	0.0026	0.0120		0.0145				0.0145	0.0087	0.1768		0.1855	0.3056
T7 Other Port-Dsl	0.0001	0.0001		0.0002				0.0002	0.0004	0.0014		0.0018	0.0080
T7 Other Port-Oth				0				0				0	
T7 POAK-Dsl	0.0002	0.0005		0.0006				0.0006	0.0010	0.0070		0.0080	0.0206
T7 POAK-Oth				0				0				0	
T7 POLA-Dsl	0.0003	0.0004		0.0007				0.0007	0.0016	0.0064		0.0080	0.0326
T7 POLA-Oth				0				0				0	
T7 POLA-NG	0.0000	0.0000		0.0000				0.0000	0.0005	0.0001		0.0006	0.0000
T7 Public-Dsl	0.0003	0.0003		0.0006				0.0006	0.0015	0.0045		0.0061	0.0192
T7 Public-Oth				0				0				0	
T7 Public-NG	0.0000	0.0000		0.0000				0.0000	0.0111	0.0018		0.0129	0.0004
T7 SWCV-Dsl	0.0001	0.0001		0.0001				0.0001	0.0002	0.0008		0.0010	0.0062
T7 SWCV-Oth				0				0				0	
T7 SWCV-NG	0.0001	0.0000		0.0001				0.0001	0.0849	0.0047		0.0896	0.0028
T7 Single-Dsl	0.0000	0.0001		0.0001				0.0001	0.0002	0.0016		0.0018	0.0031
Single Concrete/Transit Mix				0				0				0	
T7 Single-NG	0.0000	0.0000		0.0000				0.0000	0.0006	0.0002		0.0007	0.0000
T7 Single-Dsl	0.0002	0.0007		0.0008				0.0008	0.0009	0.0098		0.0107	0.0186
T7 Single Dump-Oth				0				0				0	
T7 Single-NG	0.0000	0.0000		0.0000				0.0000	0.0028	0.0010		0.0038	0.0001
T7 Single-Dsl	0.0005	0.0025		0.0030				0.0030	0.0023	0.0374		0.0398	0.0469
T7 Single Other-Oth				0				0				0	
T7 Single-NG	0.0000	0.0000		0.0000				0.0000	0.0072	0.0041		0.0114	0.0003
T7 Tractor-Dsl	0.0031	0.0159		0.0190				0.0190	0.0143	0.2351		0.2494	0.3523
T7 Tractor-Oth				0				0				0	
T7 Tractor-NG	0.0001	0.0001		0.0001				0.0001	0.0176	0.0114		0.0290	0.0008
T7 Utility-Dsl	0.0000	0.0000		0.0000				0.0000	0.0001	0.0002		0.0002	0.0007
T7 Utility-Oth				0				0				0	
T7IS - Gas				0				0				0	
T7IS - Gas	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015		0.0000	0.0016	0.0001
UBUS - Dsl	0.0000			0.0000				0.0000	0.0000			0.0000	0.0000
UBUS - Oth				0				0				0	
UBUS - Gas	0		0	0	0	0	0	0	0.0000		0.0000	0.0000	0
UBUS - NG	0.0000			0.0000				0.0000	0.0000			0.0000	0.0000

EMFAC2011 Category	NOx_IDLEX	NOx_STREX	NOx_TOTEX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CO2_TOTEX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_TOTEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL
All Vehicles	0.8500	1.10	4.75	7,939.6	166.3	146.9	8,252.9	0.0626	0.0005	0.0022	0.0653	0.2638	0.4289	0.7579
All Other Buses - Dsl	0.0002	0.0007	0.0052	3.95	0.0463		4.00	0.0000	0.0000		0.0000	0.0000	0.0002	0.0003
All Other Buses - Oth	0.0000		0.0000	0.2412	0.0074		0.2486	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
LDA - Dsl			0.0001	1.13			1.13	0.0000			0.0000	0.0000	0.0001	0.0001
LDA - Oth			0				0				0	0.0111	0.0061	0.0173
LDA - Gas		0.2072	0.4245	2,413.9		62.9	2,476.8	0.0059		0.0010	0.0070	0.0855	0.0992	0.1917
LDA - Gas		0.0060	0.0075	62.1		2.77	64.8	0.0001		0.0000	0.0002	0.0040	0.0022	0.0064
LDT1 - Dsl			0.0000	0.0025			0.0025	0.0000			0.0000	0.0000	0.0000	0.0000
LDT1 - Oth			0				0				0	0.0002	0.0001	0.0002
LDT1 - Gas		0.0142	0.0280	165.1		4.66	169.7	0.0004		0.0001	0.0005	0.0051	0.0069	0.0124
LDT1 - Gas		0.0002	0.0002	1.88		0.0974	1.98	0.0000		0.0000	0.0000	0.0001	0.0001	0.0002
LDT2 - Dsl			0.0007	5.35			5.35	0.0001			0.0001	0.0002	0.0002	0.0005
LDT2 - Oth			0				0				0	0.0012	0.0007	0.0019
LDT2 - Gas		0.1410	0.2707	1,514.1		41.8	1,555.9	0.0032		0.0006	0.0038	0.0448	0.0606	0.1092
LDT2 - Gas		0.0019	0.0023	18.9		1.05	20.0	0.0000		0.0000	0.0000	0.0012	0.0007	0.0019
LHD1 - Dsl	0.0041		0.0429	69.6	0.4306		70.0	0.0024	0.0001		0.0025	0.0014	0.0091	0.0129
LHD1 - Oth			0				0				0	0.0020	0.0096	0.0116
LHD1 - Gas	0.0001	0.0340	0.0378	138.8	0.5569	1.50	140.9	0.0002		0.0000	0.0002	0.0015	0.0146	0.0164
LHD2 - Dsl	0.0022		0.0291	38.7	0.3506		39.1	0.0015	0.0001		0.0015	0.0007	0.0050	0.0072
LHD2 - Oth			0				0				0	0.0004	0.0025	0.0030
LHD2 - Gas	0.0000	0.0031	0.0035	16.2	0.0683	0.1545	16.4	0.0000		0.0000	0.0000	0.0002	0.0018	0.0020
MCY - Gas		0.0016	0.0302	9.98		0.4959	10.5	0.0001		0.0001	0.0002	0.0002	0.0007	0.0012
MDV - Dsl			0.0005	11.1			11.1	0.0000			0.0000	0.0003	0.0004	0.0007
MDV - Oth			0				0				0	0.0011	0.0006	0.0017
MDV - Gas		0.0909	0.1698	1,016.1		30.4	1,046.5	0.0018		0.0004	0.0022	0.0248	0.0340	0.0610
MDV - Gas		0.0012	0.0015	11.4		0.8248	12.2	0.0000		0.0000	0.0000	0.0007	0.0004	0.0012
MH - Dsl			0.0102	4.23			4.23	0.0001			0.0001	0.0001	0.0002	0.0004
MH - Gas		0.0000	0.0015	13.2		0.0017	13.2	0.0000		0.0000	0.0000	0.0001	0.0003	0.0004
Motor Coach - Dsl	0.0004	0.0005	0.0034	4.06	0.1744		4.23	0.0001	0.0000		0.0001	0.0000	0.0002	0.0003
OBUS - Oth			0				0				0	0.0000	0.0001	0.0001
OBUS - Gas	0.0000	0.0006	0.0013	4.06	0.0252	0.0338	4.12	0.0000		0.0000	0.0000	0.0000	0.0001	0.0002
PTO-Dsl			0.0353	24.4			24.4	0.0001			0.0001			0.0001
PTO-Oth			0				0				0			0
SBUS - Dsl	0.0014	0.0020	0.0052	5.08	0.4325		5.51	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003
SBUS - Oth			0				0				0	0.0001	0.0002	0.0003
SBUS - Gas	0.0001	0.0003	0.0012	3.70	0.2082	0.0139	3.92	0.0000		0.0000	0.0000	0.0000	0.0002	0.0003
SBUS-Oth	0.0004		0.0007	1.63	0.3177		1.95	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 CAIRP small-Dsl	0.0000	0.0000	0.0001	0.4409	0.0031		0.4440	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 CAIRP small-Oth			0				0				0	0.0000	0.0000	0.0000
T6 CAIRP small-Dsl	0.0000	0.0001	0.0002	0.6058	0.0038		0.6096	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 CAIRP small-Oth			0				0				0	0.0000	0.0000	0.0000
T6 CAIRP small-Dsl	0.0001	0.0003	0.0006	1.58	0.0173		1.59	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 CAIRP small-Oth			0				0				0	0.0000	0.0000	0.0001
T6 CAIRP heavy-Dsl	0.0002	0.0008	0.0045	16.2	0.0449		16.3	0.0001	0.0000		0.0001	0.0002	0.0008	0.0011
T6 CAIRP heavy-Oth			0				0				0	0.0001	0.0001	0.0002
T6 instate small-Dsl	0.0011	0.0027	0.0059	6.28	0.3201		6.60	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004
T6 instate small-Oth			0				0				0	0.0001	0.0002	0.0002
T6 instate small-Dsl	0.0007	0.0018	0.0038	4.10	0.2085		4.30	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002
T6 instate small-Oth			0				0				0	0.0001	0.0001	0.0002
T6 instate small-Dsl	0.0030	0.0077	0.0168	17.8	0.9044		18.7	0.0000	0.0000		0.0000	0.0002	0.0008	0.0011
T6 instate small-Oth			0				0				0	0.0002	0.0005	0.0007
T6 instate heavy-Dsl	0.0010	0.0024	0.0070	6.96	0.2349		7.20	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004
T6 instate heavy-Oth			0				0				0	0.0001	0.0001	0.0002
T6 instate heavy-NG	0.0000		0.0000	0.2274	0.0196		0.2471	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 instate small-Dsl	0.0020	0.0046	0.0101	13.2	0.6327		13.8	0.0000	0.0000		0.0000	0.0002	0.0006	0.0008
T6 instate small-Oth			0				0				0	0.0002	0.0004	0.0005
T6 instate small-Dsl	0.0058	0.0129	0.0286	37.1	1.79		38.9	0.0001	0.0000		0.0001	0.0004	0.0017	0.0022
T6 instate small-Oth			0				0				0	0.0005	0.0010	0.0015
T6 instate small-Dsl	0.0043	0.0096	0.0214	27.6	1.33		28.9	0.0001	0.0000		0.0001	0.0003	0.0012	0.0017
T6 instate small-Oth			0				0				0	0.0004	0.0007	0.0011
T6 instate heavy-Dsl	0.0046	0.0098	0.0246	23.0	1.12		24.1	0.0001	0.0000		0.0001	0.0003	0.0010	0.0014
T6 instate heavy-Oth			0				0				0	0.0002	0.0004	0.0006
T6 instate heavy-NG	0.0001		0.0001	0.4765	0.0642		0.5407	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 instate small-Dsl	0.0000	0.0001	0.0003	0.3588	0.0149		0.3737	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 instate small-Oth			0				0				0	0.0000	0.0000	0.0000
T6 instate heavy-Dsl	0.0071	0.0151	0.0428	50.3	1.80		52.1	0.0002	0.0000		0.0002	0.0007	0.0024	0.0033
T6 instate heavy-Oth			0				0				0	0.0002	0.0003	0.0005
T6 instate heavy-NG	0.0001		0.0002	1.18	0.1097		1.28	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 OOS small-Dsl	0.0000	0.0001	0.0003	0.5795	0.0040		0.5835	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 OOS small-Dsl	0.0000	0.0001	0.0004	0.7955	0.0049		0.8004	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001
T6 OOS small-Dsl	0.0001	0.0006	0.0013	2.07	0.0223		2.10	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 OOS heavy-Dsl	0.0002	0.0008	0.0046	13.6	0.0274		13.6	0.0001	0.0000		0.0001	0.0002	0.0007	0.0010
T6 Public-Dsl	0.0002	0.0001	0.0007	0.6400	0.0477		0.6876	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Public-Oth			0				0				0	0.0000	0.0000	0.0000
T6 Public-NG	0.0000		0.0000	0.0733	0.0143		0.0876	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Public-Dsl	0.0006	0.0003	0.0017	1.80	0.1348		1.93	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T6 Public-Oth			0				0				0	0.0000	0.0000	0.0001
T6 Public-NG	0.0001		0.0001	0.2195	0.0426		0.2621	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Public-Dsl	0.0008	0.0005	0.0024	2.75	0.2059		2.96	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002
T6 Public-Oth			0				0				0	0.0000	0.0001	0.0001
T6 Public-NG	0.0001		0.0001	0.3178	0.0624		0.3803	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Public-Dsl	0.0012	0.0008	0.0036	4.67	0.2830		4.95	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003
T6 Public-Oth			0				0				0	0.0000	0.0001	0.0001
T6 Public-NG	0.0001		0.0002	0.5719	0.0926		0.6644	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Dsl	0.0001	0.0002	0.0004	0.6538	0.0227		0.6765	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Oth			0				0				0	0.0000	0.0000	0.0000
T6 Utility-NG	0.0000		0.0000	0.0013	0.0001		0.0014	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Dsl	0.0000	0.0000	0.0001	0.1236	0.0043		0.1279	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Oth			0				0				0	0.0000	0.0000	0.0000
T6 Utility-NG	0.0000		0.0000	0.0002	0.0000		0.0003	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Dsl	0.0000	0.0000	0.0001	0.1697	0.0048		0.1745	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6 Utility-Oth			0				0				0	0.0000	0.0000	0.0000
T6 Utility-NG	0.0000		0.0000	0.0003	0.0000		0.0004	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T6TS - Gas			0				0				0	0.0002	0.0004	0.0006
T6TS - Gas	0.0000	0.0022	0.0032	22.5	0.1244	0.1785	22.8	0.0000		0.0000	0.0000	0.0002	0.0007	0.0009
T7 CAIRP-Dsl	0.1549	0.0700	0.7105	512.5	38.6		551.1	0.0120	0.0001		0.0120	0.0145	0.0331	0.0597
T7 CAIRP-Oth			0				0				0	0.0042	0.0048	0.0090
T7 NNOOS-Dsl	0.3286	0.1172	1.26	747.5	50.9		798.4	0.0180	0.0001		0.0181	0.0222	0.0504	0.0906
T7 NOOS-Dsl	0.1414	0.0505	0.4975	271.4	21.9		293.3	0.0069	0.0001		0.0070	0.0080	0.0183	0.0333
T7 Other Port-Dsl	0.0008	0.0008	0.0096	8.83	0.1747		9.00	0.0001	0.0000		0.0001	0.0002	0.0006	0.0010
T7 Other Port-Oth			0				0				0	0.0001	0.0001	0.0001
T7 POAK-Dsl	0.0040	0.0041	0.0287	21.8	0.8968		22.7	0.0003	0.0000		0.0003	0.0006	0.0015	0.0024
T7 POAK-Oth			0				0				0	0.0001	0.0002	0.0003
T7 POLA-Dsl	0.0039	0.0040	0.0405	32.2	0.8292		33.0	0.0004	0.0000		0.0004	0.0008	0.0022	0.0035
T7 POLA-Oth			0				0				0	0.0002	0.0002	0.0003
T7 POLA-NG	0.0000		0.0000	0.1190	0.0088		0.1278	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T7 Public-Dsl	0.0034	0.0071	0.0297	17.2	0.6808		17.8	0.0001	0.0000		0.0001	0.0004	0.0012	0.0016
T7 Public-Oth			0				0				0	0.0003	0.0005	0.0008
T7 Public-NG	0.0002		0.0006	1.87	0.1821		2.05	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002
T7 SWCV-Dsl	0.0009	0.0010	0.0082	10.7	0.1502		10.9	0.0001	0.0000		0.0001	0.0001	0.0007	0.0008
T7 SWCV-Oth			0				0				0	0.0003	0.0009	0.0012
T7 SWCV-NG	0.0001		0.0029	10.5	0.7718		11.3	0.0000	0.0000		0.0000	0.0003	0.0018	0.0021
T7 Single-Dsl	0.0008	0.0013	0.0051	5.52	0.2119		5.73	0.0001	0.0000		0.0001	0.0001	0.0003	0.0005
Single Concrete/Transit Mix			0				0				0	0.0002	0.0002	0.0004
T7 Single-NG	0.0000		0.0000	0.1479	0.0175		0.1654	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
T7 Single-Dsl	0.0053	0.0087	0.0326	25.4	1.37		26.8	0.0003	0.0000		0.0003	0.0006	0.0015	0.0024
T7 Single Dump-Oth			0				0				0	0.0006	0.0007	0.0013
T7 Single-NG	0.0001		0.0003	0.6696	0.1063		0.7759	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T7 Single-Dsl	0.0197	0.0330	0.0996	69.7	5.10		74.8	0.0008	0.0000		0.0008	0.0017	0.0042	0.0067
T7 Single Other-Oth			0				0				0	0.0018	0.0022	0.0040
T7 Single-NG	0.0006		0.0009	1.84	0.4077		2.25	0.0000	0.0000		0.0000	0.0001	0.0002	0.0002
T7 Tractor-Dsl	0.1413	0.2244	0.7180	378.1	30.6		408.7	0.0065	0.0001		0.0066	0.0108	0.0257	0.0430
T7 Tractor-Oth			0				0				0	0.0022	0.0026	0.0048
T7 Tractor-NG	0.0015		0.0023	4.74	1.08		5.83	0.0000	0.0000		0.0000	0.0002	0.0004	0.0006
T7 Utility-Dsl	0.0001	0.0009	0.0017	1.07	0.0224		1.09	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001
T7 Utility-Oth			0				0				0	0.0000	0.0000	0.0000
T7IS - Gas			0				0				0	0.0000	0.0000	0.0000
T7IS - Gas		0.0000	0.0001	0.0886		0.0003	0.0889	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
UBUS - Dsl			0.0000	0.0059			0.0059	0.0000			0.0000	0.0000	0.0000	0.0000
UBUS - Oth			0				0				0	0.0004	0.0009	0.0013
UBUS - Gas		0	0	0.0000		0.0000	0.0000	0		0	0	0	0.0000	0.0000
UBUS - NG			0.0000	0.0270			0.0270	0.0000			0.0000	0.0000	0.0000	0.0000

PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_TOTEX	PM2_5_PMTW	PM2_5_PMBW	PM2_5_TOTAL	SOx_RUNEX	SOx_IDLEX	SOx_STREX	SOx_TOTEX	Fuel_GAS	Fuel_DSL	Fuel_NG
0.0584	0.0005	0.0020	0.0610	0.0659	0.1501	0.2780	0.0781	0.0016	0.0016	0.0812	595.1	239.8	3.46
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3597	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0306
0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.1017	
			0	0.0028	0.0021	0.0049				0			
0.0054		0.0010	0.0064	0.0214	0.0347	0.0625	0.0242		0.0007	0.0249	265.1		
0.0001		0.0000	0.0001	0.0010	0.0008	0.0019	0.0006		0.0000	0.0007	6.94		
0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0022	
			0	0.0000	0.0000	0.0001				0			
0.0003		0.0001	0.0004	0.0013	0.0024	0.0041	0.0017		0.0000	0.0017	18.2		
0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000		0.0000	0.0000	0.2115		
0.0001			0.0001	0.0000	0.0001	0.0002	0.0001			0.0001		0.4816	
			0	0.0003	0.0002	0.0005				0			
0.0029		0.0005	0.0035	0.0112	0.0212	0.0359	0.0152		0.0004	0.0156	186.5		
0.0000		0.0000	0.0000	0.0003	0.0002	0.0006	0.0002		0.0000	0.0002	2.14		
0.0023	0.0001		0.0024	0.0009	0.0032	0.0059	0.0007	0.0000		0.0007		6.30	
			0	0.0005	0.0034	0.0039				0			
0.0002		0.0000	0.0002	0.0004	0.0051	0.0057	0.0014	0.0000	0.0000	0.0014	15.1		
0.0014	0.0000		0.0014	0.0002	0.0018	0.0034	0.0004	0.0000		0.0004		3.51	
			0	0.0001	0.0009	0.0010				0			
0.0000		0.0000	0.0000	0.0000	0.0006	0.0007	0.0002	0.0000	0.0000	0.0002	1.76		
0.0001		0.0001	0.0002	0.0001	0.0003	0.0005	0.0001		0.0000	0.0001	1.28		
0.0000			0.0000	0.0001	0.0001	0.0002	0.0001			0.0001		0.9975	
			0	0.0003	0.0002	0.0005				0			
0.0017		0.0003	0.0020	0.0062	0.0119	0.0201	0.0102		0.0003	0.0105	111.9		
0.0000		0.0000	0.0000	0.0002	0.0001	0.0004	0.0001		0.0000	0.0001	1.31		
0.0001			0.0001	0.0000	0.0001	0.0002	0.0000			0.0000		0.3811	
0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0001		0.0000	0.0001	1.40		
0.0001	0.0000		0.0001	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3811	
			0	0.0000	0.0000	0.0000				0			
0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.4396		
0.0001			0.0001			0.0001	0.0002			0.0002		2.20	
			0			0				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0001		0.4962	
			0	0.0000	0.0001	0.0001				0			
0.0000		0.0000	0.0000	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.4203		
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.2394
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0400	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0549	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1433	
			0	0.0000	0.0000	0.0000				0			
0.0001	0.0000		0.0001	0.0001	0.0003	0.0004	0.0002	0.0000		0.0002		1.46	
			0	0.0000	0.0000	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.5943	
			0	0.0000	0.0001	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3873	
			0	0.0000	0.0000	0.0001				0			
0.0000	0.0000		0.0000	0.0001	0.0003	0.0004	0.0002	0.0000		0.0002		1.68	
			0	0.0001	0.0002	0.0002				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.6478	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0304
0.0000	0.0000		0.0000	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		1.24	
			0	0.0000	0.0001	0.0002				0			
0.0001	0.0000		0.0001	0.0001	0.0006	0.0008	0.0004	0.0000		0.0004		3.50	
			0	0.0001	0.0003	0.0005				0			
0.0001	0.0000		0.0001	0.0001	0.0004	0.0006	0.0003	0.0000		0.0003		2.60	
			0	0.0001	0.0003	0.0004				0			
0.0001	0.0000		0.0001	0.0001	0.0004	0.0005	0.0002	0.0000		0.0002		2.17	
			0	0.0001	0.0001	0.0002				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0665
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0336	
			0	0.0000	0.0000	0.0000				0			
0.0002	0.0000		0.0002	0.0002	0.0009	0.0012	0.0005	0.0000		0.0005		4.69	
			0	0.0000	0.0001	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.1581
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0525	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0720	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.1887	
0.0001	0.0000		0.0001	0.0000	0.0002	0.0004	0.0001	0.0000		0.0001		1.23	
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0619	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0108
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1739	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0322
0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2665	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0468
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.4454	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0817
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0609	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0002
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0115	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0000
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0157	
			0	0.0000	0.0000	0.0000				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0000
			0	0.0001	0.0001	0.0002				0			
0.0000		0.0000	0.0000	0.0000	0.0002	0.0003	0.0002	0.0000	0.0000	0.0002	2.43		
0.0114	0.0001		0.0115	0.0036	0.0116	0.0267	0.0049	0.0004		0.0053		49.6	
			0	0.0010	0.0017	0.0027				0			
0.0172	0.0001		0.0173	0.0058	0.0178	0.0405	0.0071	0.0005		0.0076		71.9	
0.0066	0.0000		0.0067	0.0020	0.0064	0.0151	0.0026	0.0002		0.0028		26.4	
0.0001	0.0000		0.0001	0.0001	0.0002	0.0004	0.0001	0.0000		0.0001		0.8102	
			0	0.0000	0.0000	0.0000				0			
0.0003	0.0000		0.0003	0.0001	0.0005	0.0009	0.0002	0.0000		0.0002		2.04	
			0	0.0000	0.0001	0.0001				0			
0.0004	0.0000		0.0004	0.0002	0.0008	0.0014	0.0003	0.0000		0.0003		2.97	
			0	0.0000	0.0001	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0157
0.0001	0.0000		0.0001	0.0001	0.0004	0.0006	0.0002	0.0000		0.0002		1.61	
			0	0.0001	0.0002	0.0002				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001				0			0.2526
0.0001	0.0000		0.0001	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		0.9804	
			0	0.0001	0.0003	0.0004				0			
0.0000	0.0000		0.0000	0.0001	0.0006	0.0007				0			1.38
0.0001	0.0000		0.0001	0.0000	0.0001	0.0002	0.0001	0.0000		0.0001		0.5180	
			0	0.0000	0.0001	0.0001				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0203
0.0003	0.0000		0.0003	0.0002	0.0005	0.0010	0.0002	0.0000		0.0003		2.41	
			0	0.0001	0.0002	0.0004				0			
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0954
0.0007	0.0000		0.0008	0.0004	0.0015	0.0027	0.0007	0.0000		0.0007		6.73	
			0	0.0004	0.0008	0.0012				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0001				0			0.2769
0.0062	0.0001		0.0063	0.0027	0.0090	0.0180	0.0036	0.0003		0.0039		36.8	
			0	0.0005	0.0009	0.0015				0			
0.0000	0.0000		0.0000	0.0000	0.0001	0.0002				0			0.7176
0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0979	
			0	0.0000	0.0000	0.0000				0			
			0	0.0000	0.0000	0.0000				0			
0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0097		
0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0005	
			0	0.0001	0.0003	0.0004				0			
0		0	0	0	0	0.0000	0		0	0	0.0050		
0.0000			0.0000	0.0000	0.0000	0.0000				0			0.0033

Veh_Tech	EMFAC2011 Category	Population	Total_VMT	cVMT	eVMT	Trips	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_TOTEX	TOG_DIURN	TOG_HTSK	TOG_RUNLS
All Other Buses-Dsl	All Other Buses - Dsl	78.1	3,478.1	3,478.1	0	695.2	0.0002	0.0000		0.0002			
LDA-Dsl	LDA - Dsl	159.0	5,653.0	5,653.0	0	707.1	0.0000			0.0000			
LDT1-Dsl	LDT1 - Dsl	0.1795	6.80	6.80	0	0.8277	0.0000			0.0000			
LDT2-Dsl	LDT2 - Dsl	508.9	19,369.2	19,369.2	0	2,347.0	0.0004			0.0004			
LHD1-Dsl	LHD1 - Dsl	3,338.8	105,505.2	105,505.2	0	41,997.7	0.0124	0.0005		0.0128			
LHD2-Dsl	LHD2 - Dsl	1,661.6	50,089.5	50,089.5	0	20,900.4	0.0074	0.0002		0.0076			
MDV-Dsl	MDV - Dsl	898.8	30,737.8	30,737.8	0	4,041.5	0.0003			0.0003			
MH-Dsl	MH - Dsl	398.6	3,552.5	3,552.5	0	39.9	0.0004			0.0004			
Motor Coach-Dsl	Motor Coach - Dsl	19.1	2,427.3	2,427.3	0	439.5	0.0000	0.0001		0.0001			
PTO-Dsl	PTO-Dsl	0	12,867.1	12,867.1	0		0.0002			0.0002			
SBUS-Dsl	SBUS - Dsl	213.5	4,495.7	4,495.7	0	3,090.8	0.0000	0.0000		0.0001			
T6 CAIRP Class 4-Dsl	T6 CAIRP small-Dsl	5.53	397.4	397.4	0	127.0	0.0000	0.0000		0.0000			
T6 CAIRP Class 5-Dsl	T6 CAIRP small-Dsl	6.79	545.9	545.9	0	156.1	0.0000	0.0000		0.0000			
T6 CAIRP Class 6-Dsl	T6 CAIRP small-Dsl	30.8	1,420.9	1,420.9	0	708.5	0.0000	0.0000		0.0000			
T6 CAIRP Class 7-Dsl	T6 CAIRP heavy-Dsl	81.9	16,560.2	16,560.2	0	1,881.1	0.0001	0.0000		0.0001			
T6 Instate Delivery Class 4-Dsl	T6 instate small-Dsl	166.8	5,500.5	5,500.5	0	2,380.3	0.0000	0.0000		0.0001			
T6 Instate Delivery Class 5-Dsl	T6 instate small-Dsl	108.6	3,581.6	3,581.6	0	1,550.0	0.0000	0.0000		0.0000			
T6 Instate Delivery Class 6-Dsl	T6 instate small-Dsl	471.3	15,540.0	15,540.0	0	6,725.5	0.0001	0.0001		0.0002			
T6 Instate Delivery Class 7-Dsl	T6 instate heavy-Dsl	117.2	5,938.6	5,938.6	0	1,672.3	0.0001	0.0000		0.0001			
T6 Instate Other Class 4-Dsl	T6 instate small-Dsl	306.6	11,883.2	11,883.2	0	3,544.4	0.0001	0.0001		0.0001			
T6 Instate Other Class 5-Dsl	T6 instate small-Dsl	865.5	33,551.2	33,551.2	0	10,005.2	0.0002	0.0002		0.0004			
T6 Instate Other Class 6-Dsl	T6 instate small-Dsl	643.9	24,941.8	24,941.8	0	7,444.0	0.0002	0.0001		0.0003			
T6 Instate Other Class 7-Dsl	T6 instate heavy-Dsl	519.4	20,605.7	20,605.7	0	6,004.6	0.0002	0.0001		0.0003			
T6 Instate Tractor Class 6-Dsl	T6 instate small-Dsl	7.23	324.1	324.1	0	83.5	0.0000	0.0000		0.0000			
T6 Instate Tractor Class 7-Dsl	T6 instate heavy-Dsl	853.1	49,353.6	49,353.6	0	9,861.9	0.0004	0.0002		0.0006			
T6 OOS Class 4-Dsl	T6 OOS small-Dsl	7.61	556.4	556.4	0	174.9	0.0000	0.0000		0.0000			
T6 OOS Class 5-Dsl	T6 OOS small-Dsl	9.36	763.2	763.2	0	215.0	0.0000	0.0000		0.0000			
T6 OOS Class 6-Dsl	T6 OOS small-Dsl	42.4	1,994.3	1,994.3	0	974.8	0.0000	0.0000		0.0000			
T6 OOS Class 7-Dsl	T6 OOS heavy-Dsl	52.2	14,501.1	14,501.1	0	1,199.9	0.0001	0.0000		0.0001			
T6 Public Class 4-Dsl	T6 Public-Dsl	15.7	538.4	538.4	0	80.4	0.0000	0.0000		0.0000			
T6 Public Class 5-Dsl	T6 Public-Dsl	43.9	1,506.5	1,506.5	0	225.3	0.0000	0.0000		0.0000			
T6 Public Class 6-Dsl	T6 Public-Dsl	67.7	2,319.4	2,319.4	0	347.4	0.0000	0.0000		0.0001			
T6 Public Class 7-Dsl	T6 Public-Dsl	95.0	3,976.4	3,976.4	0	487.5	0.0000	0.0000		0.0001			
T6 Utility Class 5-Dsl	T6 Utility-Dsl	14.8	588.0	588.0	0	189.0	0.0000	0.0000		0.0000			
T6 Utility Class 6-Dsl	T6 Utility-Dsl	2.79	111.1	111.1	0	35.7	0.0000	0.0000		0.0000			
T6 Utility Class 7-Dsl	T6 Utility-Dsl	3.10	152.5	152.5	0	39.7	0.0000	0.0000		0.0000			
T7 CAIRP Class 8-Dsl	T7 CAIRP-Dsl	1,757.2	366,447.5	366,447.5	0	40,379.8	0.0052	0.0230		0.0283			
T7 NNOOS Class 8-Dsl	T7 NNOOS-Dsl	1,947.7	558,325.6	558,325.6	0	44,757.6	0.0078	0.0317		0.0394			
T7 NOOS Class 8-Dsl	T7 NOOS-Dsl	838.2	202,829.8	202,829.8	0	19,262.0	0.0029	0.0136		0.0165			
T7 Other Port Class 8-Dsl	T7 Other Port-Dsl	24.5	5,884.1	5,884.1	0	400.2	0.0001	0.0001		0.0002			
T7 POAK Class 8-Dsl	T7 POAK-Dsl	125.6	14,562.6	14,562.6	0	2,054.5	0.0002	0.0005		0.0007			
T7 POLA Class 8-Dsl	T7 POLA-Dsl	114.6	21,247.5	21,247.5	0	1,874.3	0.0003	0.0005		0.0008			
T7 Public Class 8-Dsl	T7 Public-Dsl	242.5	9,765.6	9,765.6	0	1,244.0	0.0003	0.0004		0.0007			
T7 SWCV Class 8-Dsl	T7 SWCV-Dsl	44.5	2,887.8	2,887.8	0	204.7	0.0001	0.0001		0.0002			
T7 Single Concrete/Transit Mix Class 8-Dsl	T7 Single-Dsl	52.8	3,488.3	3,488.3	0	497.7	0.0000	0.0001		0.0002			
T7 Single Dump Class 8-Dsl	T7 Single-Dsl	321.9	15,625.7	15,625.7	0	3,032.6	0.0002	0.0008		0.0010			
T7 Single Other Class 8-Dsl	T7 Single-Dsl	1,234.9	43,426.8	43,426.8	0	11,633.1	0.0005	0.0029		0.0034			
T7 Tractor Class 8-Dsl	T7 Tractor-Dsl	4,176.7	271,231.2	271,231.2	0	60,687.9	0.0035	0.0181		0.0216			
T7 Utility Class 8-Dsl	T7 Utility-Dsl	15.3	632.3	632.3	0	196.3	0.0000	0.0000		0.0000			
UBUS-Dsl	UBUS - Dsl	0.2247	8.11	8.11	0	0.8988	0.0000			0.0000			
	TOTALs	22,712.5	1,971,697.6	1,971,697.6	0.0	316,599.5	0.0	0.1	0.0	0.1	0.0	0.0	0.0

TOG_TOTAL	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_TOTEX	ROG_DIURN	ROG_HTSK	ROG_RUNLS	ROG_TOTAL	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	NOx_RUNEX	NOx_IDLEX	NOx_STREX
0.0002	0.0002	0.0000		0.0002				0.0002	0.0007	0.0002		0.0008	0.0044	0.0002	0.0007
0.0000	0.0000			0.0000				0.0000	0.0012			0.0012	0.0001		
0.0000	0.0000			0.0000				0.0000	0.0000			0.0000	0.0000		
0.0004	0.0004			0.0004				0.0004	0.0041			0.0041	0.0007		
0.0128	0.0109	0.0004		0.0113				0.0113	0.0282	0.0033		0.0315	0.0388	0.0041	
0.0076	0.0065	0.0002		0.0067				0.0067	0.0172	0.0017		0.0188	0.0269	0.0022	
0.0003	0.0002			0.0002				0.0002	0.0071			0.0071	0.0005		
0.0004	0.0003			0.0003				0.0003	0.0010			0.0010	0.0102		
0.0001	0.0000	0.0001		0.0001				0.0001	0.0001	0.0012		0.0013	0.0025	0.0004	0.0005
0.0002	0.0002			0.0002				0.0002	0.0025			0.0025	0.0353		
0.0001	0.0000	0.0000		0.0001				0.0001	0.0003	0.0017		0.0019	0.0018	0.0014	0.0020
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0001	0.0000	0.0000
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0001	0.0000	0.0001
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0003	0.0001	0.0003
0.0001	0.0001	0.0000		0.0001				0.0001	0.0005	0.0002		0.0007	0.0035	0.0002	0.0008
0.0001	0.0000	0.0000		0.0001				0.0001	0.0003	0.0013		0.0016	0.0022	0.0011	0.0027
0.0000	0.0000	0.0000		0.0000				0.0000	0.0002	0.0008		0.0011	0.0014	0.0007	0.0018
0.0002	0.0001	0.0001		0.0002				0.0002	0.0009	0.0037		0.0046	0.0061	0.0030	0.0077
0.0001	0.0001	0.0000		0.0001				0.0001	0.0004	0.0009		0.0013	0.0037	0.0010	0.0024
0.0001	0.0001	0.0001		0.0001				0.0001	0.0005	0.0026		0.0031	0.0035	0.0020	0.0046
0.0004	0.0002	0.0002		0.0004				0.0004	0.0016	0.0072		0.0088	0.0098	0.0058	0.0129
0.0003	0.0001	0.0001		0.0003				0.0003	0.0012	0.0054		0.0065	0.0074	0.0043	0.0096
0.0003	0.0002	0.0001		0.0003				0.0003	0.0012	0.0043		0.0055	0.0103	0.0046	0.0098
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0001	0.0000	0.0001
0.0006	0.0004	0.0002		0.0005				0.0005	0.0027	0.0071		0.0098	0.0206	0.0071	0.0151
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0001	0.0000	0.0001
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0002	0.0000	0.0001
0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0001		0.0002	0.0005	0.0001	0.0006
0.0001	0.0001	0.0000		0.0001				0.0001	0.0005	0.0001		0.0006	0.0037	0.0002	0.0008
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0002		0.0002	0.0004	0.0002	0.0001
0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0005		0.0006	0.0009	0.0006	0.0003
0.0001	0.0000	0.0000		0.0000				0.0000	0.0001	0.0008		0.0009	0.0011	0.0008	0.0005
0.0001	0.0000	0.0000		0.0001				0.0001	0.0002	0.0011		0.0013	0.0017	0.0012	0.0008
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0001	0.0001	0.0002
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
0.0283	0.0046	0.0202		0.0248				0.0248	0.0156	0.2986		0.3142	0.4856	0.1549	0.0700
0.0394	0.0068	0.0278		0.0346				0.0346	0.0231	0.4108		0.4339	0.8179	0.3286	0.1172
0.0165	0.0026	0.0120		0.0145				0.0145	0.0087	0.1768		0.1855	0.3056	0.1414	0.0505
0.0002	0.0001	0.0001		0.0002				0.0002	0.0004	0.0014		0.0018	0.0080	0.0008	0.0008
0.0007	0.0002	0.0005		0.0006				0.0006	0.0010	0.0070		0.0080	0.0206	0.0040	0.0041
0.0008	0.0003	0.0004		0.0007				0.0007	0.0016	0.0064		0.0080	0.0326	0.0039	0.0040
0.0007	0.0003	0.0003		0.0006				0.0006	0.0015	0.0045		0.0061	0.0192	0.0034	0.0071
0.0002	0.0001	0.0001		0.0001				0.0001	0.0002	0.0008		0.0010	0.0062	0.0009	0.0010
0.0002	0.0000	0.0001		0.0001				0.0001	0.0002	0.0016		0.0018	0.0031	0.0008	0.0013
0.0010	0.0002	0.0007		0.0008				0.0008	0.0009	0.0098		0.0107	0.0186	0.0053	0.0087
0.0034	0.0005	0.0025		0.0030				0.0030	0.0023	0.0374		0.0398	0.0469	0.0197	0.0330
0.0216	0.0031	0.0159		0.0190				0.0190	0.0143	0.2351		0.2494	0.3523	0.1413	0.2244
0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0002		0.0002	0.0007	0.0001	0.0009
0.0000	0.0000			0.0000				0.0000	0.0000			0.0000	0.0000		
0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	1.2	0.0	1.4	2.3	0.8	0.6

NOx_TOTEX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CO2_TOTEX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_TOTEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_TOTEX
0.0052	3.95	0.0463		4.00	0.0000	0.0000		0.0000	0.0000	0.0002	0.0003	0.0000	0.0000		0.0000
0.0001	1.13			1.13	0.0000			0.0000	0.0000	0.0001	0.0001	0.0000			0.0000
0.0000	0.0025			0.0025	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000
0.0007	5.35			5.35	0.0001			0.0001	0.0002	0.0002	0.0005	0.0001			0.0001
0.0429	69.6	0.4306		70.0	0.0024	0.0001		0.0025	0.0014	0.0091	0.0129	0.0023	0.0001		0.0024
0.0291	38.7	0.3506		39.1	0.0015	0.0001		0.0015	0.0007	0.0050	0.0072	0.0014	0.0000		0.0014
0.0005	11.1			11.1	0.0000			0.0000	0.0003	0.0004	0.0007	0.0000			0.0000
0.0102	4.23			4.23	0.0001			0.0001	0.0001	0.0002	0.0004	0.0001			0.0001
0.0034	4.06	0.1744		4.23	0.0001	0.0000		0.0001	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001
0.0353	24.4			24.4	0.0001			0.0001			0.0001	0.0001			0.0001
0.0052	5.08	0.4325		5.51	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003	0.0000	0.0000		0.0000
0.0001	0.4409	0.0031		0.4440	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0002	0.6058	0.0038		0.6096	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0006	1.58	0.0173		1.59	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000
0.0045	16.2	0.0449		16.3	0.0001	0.0000		0.0001	0.0002	0.0008	0.0011	0.0001	0.0000		0.0001
0.0059	6.28	0.3201		6.60	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004	0.0000	0.0000		0.0000
0.0038	4.10	0.2085		4.30	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002	0.0000	0.0000		0.0000
0.0168	17.8	0.9044		18.7	0.0000	0.0000		0.0000	0.0002	0.0008	0.0011	0.0000	0.0000		0.0000
0.0070	6.96	0.2349		7.20	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004	0.0000	0.0000		0.0000
0.0101	13.2	0.6327		13.8	0.0000	0.0000		0.0000	0.0002	0.0006	0.0008	0.0000	0.0000		0.0000
0.0286	37.1	1.79		38.9	0.0001	0.0000		0.0001	0.0004	0.0017	0.0022	0.0001	0.0000		0.0001
0.0214	27.6	1.33		28.9	0.0001	0.0000		0.0001	0.0003	0.0012	0.0017	0.0001	0.0000		0.0001
0.0246	23.0	1.12		24.1	0.0001	0.0000		0.0001	0.0003	0.0010	0.0014	0.0001	0.0000		0.0001
0.0003	0.3588	0.0149		0.3737	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0428	50.3	1.80		52.1	0.0002	0.0000		0.0002	0.0007	0.0024	0.0033	0.0002	0.0000		0.0002
0.0003	0.5795	0.0040		0.5835	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0004	0.7955	0.0049		0.8004	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000
0.0013	2.07	0.0223		2.10	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000
0.0046	13.6	0.0274		13.6	0.0001	0.0000		0.0001	0.0002	0.0007	0.0010	0.0001	0.0000		0.0001
0.0007	0.6400	0.0477		0.6876	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0017	1.80	0.1348		1.93	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000
0.0024	2.75	0.2059		2.96	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000
0.0036	4.67	0.2830		4.95	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003	0.0000	0.0000		0.0000
0.0004	0.6538	0.0227		0.6765	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0001	0.1236	0.0043		0.1279	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.0001	0.1697	0.0048		0.1745	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
0.7105	512.5	38.6		551.1	0.0120	0.0001		0.0120	0.0145	0.0331	0.0597	0.0114	0.0001		0.0115
1.26	747.5	50.9		798.4	0.0180	0.0001		0.0181	0.0222	0.0504	0.0906	0.0172	0.0001		0.0173
0.4975	271.4	21.9		293.3	0.0069	0.0001		0.0070	0.0080	0.0183	0.0333	0.0066	0.0000		0.0067
0.0096	8.83	0.1747		9.00	0.0001	0.0000		0.0001	0.0002	0.0006	0.0010	0.0001	0.0000		0.0001
0.0287	21.8	0.8968		22.7	0.0003	0.0000		0.0003	0.0006	0.0015	0.0024	0.0003	0.0000		0.0003
0.0405	32.2	0.8292		33.0	0.0004	0.0000		0.0004	0.0008	0.0022	0.0035	0.0004	0.0000		0.0004
0.0297	17.2	0.6808		17.8	0.0001	0.0000		0.0001	0.0004	0.0012	0.0016	0.0001	0.0000		0.0001
0.0082	10.7	0.1502		10.9	0.0001	0.0000		0.0001	0.0001	0.0007	0.0008	0.0001	0.0000		0.0001
0.0051	5.52	0.2119		5.73	0.0001	0.0000		0.0001	0.0001	0.0003	0.0005	0.0001	0.0000		0.0001
0.0326	25.4	1.37		26.8	0.0003	0.0000		0.0003	0.0006	0.0015	0.0024	0.0003	0.0000		0.0003
0.0996	69.7	5.10		74.8	0.0008	0.0000		0.0008	0.0017	0.0042	0.0067	0.0007	0.0000		0.0008
0.7180	378.1	30.6		408.7	0.0065	0.0001		0.0066	0.0108	0.0257	0.0430	0.0062	0.0001		0.0063
0.0017	1.07	0.0224		1.09	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000
0.0000	0.0059			0.0059	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000
3.8	2,502.9	162.0	0.0	2,665.0	0.1	0.0	0.0	0.1	0.1	0.2	0.3	0.0	0.0	0.0	0.0

PM2_5_PMTW	PM2_5_PMBW	PM2_5_TOTAL	SOx_RUNEX	SOx_IDLEX	SOx_STREX	SOx_TOTEX	Fuel_GAS	Fuel_DSL	Fuel_NG
0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3597	
0.0000	0.0000	0.0000	0.0000			0.0000		0.1017	
0.0000	0.0000	0.0000	0.0000			0.0000		0.0002	
0.0000	0.0001	0.0002	0.0001			0.0001		0.4816	
0.0003	0.0032	0.0059	0.0007	0.0000		0.0007		6.30	
0.0002	0.0018	0.0034	0.0004	0.0000		0.0004		3.51	
0.0001	0.0001	0.0002	0.0001			0.0001		0.9975	
0.0000	0.0001	0.0002	0.0000			0.0000		0.3811	
0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3811	
		0.0001	0.0002			0.0002		2.20	
0.0000	0.0001	0.0001	0.0000	0.0000		0.0001		0.4962	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0400	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0549	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1433	
0.0001	0.0003	0.0004	0.0002	0.0000		0.0002		1.46	
0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.5943	
0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3873	
0.0001	0.0003	0.0004	0.0002	0.0000		0.0002		1.68	
0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.6478	
0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		1.24	
0.0001	0.0006	0.0008	0.0004	0.0000		0.0004		3.50	
0.0001	0.0004	0.0006	0.0003	0.0000		0.0003		2.60	
0.0001	0.0004	0.0005	0.0002	0.0000		0.0002		2.17	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0336	
0.0002	0.0009	0.0012	0.0005	0.0000		0.0005		4.69	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0525	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0720	
0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.1887	
0.0000	0.0002	0.0004	0.0001	0.0000		0.0001		1.23	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0619	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1739	
0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2665	
0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.4454	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0609	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0115	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0157	
0.0036	0.0116	0.0267	0.0049	0.0004		0.0053		49.6	
0.0055	0.0176	0.0405	0.0071	0.0005		0.0076		71.9	
0.0020	0.0064	0.0151	0.0026	0.0002		0.0028		26.4	
0.0001	0.0002	0.0004	0.0001	0.0000		0.0001		0.8102	
0.0001	0.0005	0.0009	0.0002	0.0000		0.0002		2.04	
0.0002	0.0008	0.0014	0.0003	0.0000		0.0003		2.97	
0.0001	0.0004	0.0006	0.0002	0.0000		0.0002		1.61	
0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		0.9804	
0.0000	0.0001	0.0002	0.0001	0.0000		0.0001		0.5160	
0.0002	0.0005	0.0010	0.0002	0.0000		0.0003		2.41	
0.0004	0.0015	0.0027	0.0007	0.0000		0.0007		6.73	
0.0027	0.0090	0.0180	0.0036	0.0003		0.0039		36.8	
0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0979	
0.0000	0.0000	0.0000	0.0000			0.0000		0.0005	
0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	239.8	0.0

SJCOG 2022 RTP/SCS GHG Emissions Estimates Annual Emissions (metric tons per year)				
Year	SJCOG			
	CO_2	CH_4	N_2O	CO_2e
Baseline (2016)	3,114,700	194	259	3,196,610
2046 No Build	2,746,806	55	189	2,804,447
2046 Scenario B	2,767,753	55	190	2,825,832
2046 Project (Scenario E)	**2,779,300**	**56**	**191**	**2,837,622**
Net Change (2016 to 2046 Project)	**(335,400)**	**(139)**	**(68)**	**(358,988)**
% Change (2016 to 2046 Project)	**-10.77%**	**-71.33%**	**-26.12%**	**-11.23%**
Net Change (2046 Project to 2046 No Build)	32,493	1	2	33,175
Net Change (2046 Project to 2046 ScenB)	11,547	0	1	11,790

2016 Population	732,185
2046 Population	994,257

**GWPs of 25 for CH_4 and 298 for N_2O were utilized to calculate CO_2e (consistent with CARB's 2017 Scoping Plan, which relied on IPCC AR4 estimates).*

	SJCOG			
	Existing (2016)	2046 No Build	2046 Scenario B	**2046 Project (Scenario E)**
Daily VMT	17,015,116	23,220,752	23,397,883	23,495,442
Daily Trips	2,276,639	3,063,084	3,086,045	3,099,319
Daily Vehicles	435,231	588,960	593,453	595,927

- Daily VMT provided by SJCOG. ***Induced Demand not included.*** *Daily Trips and Daily Vehicles based on EMFAC2021 Planning Inventory outputs for the respective year.*

Days per Year	365

SB 32 Analysis - CO_2 Emissions Estimates						
		SJCOG				
Year	VMT	CO_2 (tons/day)	CO_2 (lbs/day)	Population	Per Capita CO_2 (lbs/person/day)	% change from 1990 Baseline
1990*	n/a	n/a	n/a	n/a	23.0	n/a
2005	14,600,612	8,734.1	17,468,200.00	645,059	27.1	n/a
Baseline (2016)	17,015,116	9,231.4	18,462,800.00	732,185	25.2	9.5%
2030 with 2022 RTP/SCS**	20,686,572	8,552.8	17,105,600.00	882,163	19.4	-15.8%
2046 with 2022 RTP/SCS	23,495,442	8,287.3	16,574,600.00	994,257	16.7	-27.6%

*1990 per capita levels assumed to be 15% below 2005 levels

**2030 VMT calculated via linear interpolation using 2029 and 2031 values. Population from SJCOG Demographic Forecast

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: MPO
Region: SJCOG
Calendar Year: 2016
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Fleet Mix (Population)	VMT	Fleet Mix (VMT)	Trips	Fleet Mix (Trips)
SJCOG	2016	All Other Buses	Aggregate	Aggregate	Diesel	70.91	0.02%	3225.87155	0.02%	631.099	0.03%
SJCOG	2016	LDA	Aggregate	Aggregate	Gasoline	231784.6221	49.06%	9410786.552	50.95%	1073641.52	43.45%
SJCOG	2016	LDA	Aggregate	Aggregate	Diesel	1180.008278	0.25%	47111.60297	0.26%	5380.96023	0.22%
SJCOG	2016	LDA	Aggregate	Aggregate	Electricity	703.4435249	0.15%	24627.41372	0.13%	3578.58363	0.14%
SJCOG	2016	LDA	Aggregate	Aggregate	Plug-in Hybrid	1350.795861	0.29%	72765.42309	0.39%	5585.54088	0.23%
SJCOG	2016	LDT1	Aggregate	Aggregate	Gasoline	24430.02172	5.17%	823752.5353	4.46%	106850.451	4.32%
SJCOG	2016	LDT1	Aggregate	Aggregate	Diesel	38.8560307	0.01%	749.1081564	0.00%	138.533964	0.01%
SJCOG	2016	LDT1	Aggregate	Aggregate	Electricity	8.025104049	0.00%	199.2956949	0.00%	36.4780101	0.00%
SJCOG	2016	LDT2	Aggregate	Aggregate	Gasoline	76380.49359	16.17%	2877639.525	15.58%	349154.375	14.13%
SJCOG	2016	LDT2	Aggregate	Aggregate	Diesel	136.5140048	0.03%	6301.257053	0.03%	649.390978	0.03%
SJCOG	2016	LDT2	Aggregate	Aggregate	Electricity	7.993196154	0.00%	202.7319526	0.00%	36.6191796	0.00%
SJCOG	2016	LDT2	Aggregate	Aggregate	Plug-in Hybrid	7.300923101	0.00%	414.4462327	0.00%	30.189317	0.00%
SJCOG	2016	LHD1	Aggregate	Aggregate	Gasoline	8792.111987	1.86%	287903.0038	1.56%	130989.368	5.30%
SJCOG	2016	LHD1	Aggregate	Aggregate	Diesel	8989.768645	1.90%	339914.69	1.84%	113079.98	4.58%
SJCOG	2016	LHD2	Aggregate	Aggregate	Gasoline	1061.533975	0.22%	36176.54137	0.20%	15815.2745	0.64%
SJCOG	2016	LHD2	Aggregate	Aggregate	Diesel	2551.905069	0.54%	101421.807	0.55%	32099.7555	1.30%
SJCOG	2016	MCY	Aggregate	Aggregate	Gasoline	12580.6502	2.66%	75688.30681	0.41%	25161.3004	1.02%
SJCOG	2016	MDV	Aggregate	Aggregate	Gasoline	83198.99582	17.61%	2870153.138	15.54%	377070.962	15.26%
SJCOG	2016	MDV	Aggregate	Aggregate	Diesel	941.3081731	0.20%	44021.69719	0.24%	4613.84633	0.19%
SJCOG	2016	MDV	Aggregate	Aggregate	Electricity	0.994845578	0.00%	21.44557848	0.00%	4.3653227	0.00%
SJCOG	2016	MDV	Aggregate	Aggregate	Plug-in Hybrid	34.83424526	0.01%	1948.613541	0.01%	144.039604	0.01%
SJCOG	2016	MH	Aggregate	Aggregate	Gasoline	1996.823529	0.42%	16769.78828	0.09%	199.762226	0.01%
SJCOG	2016	MH	Aggregate	Aggregate	Diesel	604.1922926	0.13%	5838.373233	0.03%	60.4192293	0.00%
SJCOG	2016	Motor Coach	Aggregate	Aggregate	Diesel	19.06807515	0.00%	2371.692937	0.01%	438.184367	0.02%
SJCOG	2016	OBUS	Aggregate	Aggregate	Gasoline	207.8527552	0.04%	11208.68551	0.06%	4158.71793	0.17%
SJCOG	2016	PTO	Aggregate	Aggregate	Diesel	0	0.00%	18329.45792	0.10%	0	0.00%
SJCOG	2016	SBUS	Aggregate	Aggregate	Gasoline	40.37612361	0.01%	2210.642554	0.01%	161.504494	0.01%
SJCOG	2016	SBUS	Aggregate	Aggregate	Diesel	543.0266424	0.11%	11447.81662	0.06%	7863.02578	0.32%
SJCOG	2016	SBUS	Aggregate	Aggregate	Natural Gas	58.21335758	0.01%	1352.332365	0.01%	842.929418	0.03%
SJCOG	2016	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	8.259909923	0.00%	627.1338631	0.00%	189.81273	0.01%
SJCOG	2016	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	10.70616483	0.00%	860.3148867	0.00%	246.027668	0.01%
SJCOG	2016	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	27.67839628	0.01%	2248.027413	0.01%	636.049546	0.03%
SJCOG	2016	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	90.32002179	0.02%	14100.76421	0.08%	2075.5541	0.08%
SJCOG	2016	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	292.7862967	0.06%	7578.179485	0.04%	4178.06045	0.17%
SJCOG	2016	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	213.9234396	0.05%	4929.234121	0.03%	3052.68748	0.12%
SJCOG	2016	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	724.0968442	0.15%	21391.88152	0.12%	10332.862	0.42%
SJCOG	2016	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	318.8048478	0.07%	6425.407336	0.03%	4549.34518	0.18%
SJCOG	2016	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	0.018637914	0.00%	0.398486996	0.00%	0.26596303	0.00%
SJCOG	2016	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	585.1996204	0.12%	16842.29427	0.09%	6764.90761	0.27%
SJCOG	2016	T6 Instate Other Class 5	Aggregate	Aggregate	Diesel	931.8145632	0.20%	47551.45978	0.26%	10771.7764	0.44%
SJCOG	2016	T6 Instate Other Class 6	Aggregate	Aggregate	Diesel	923.5006626	0.20%	35318.25977	0.19%	10675.6677	0.43%
SJCOG	2016	T6 Instate Other Class 7	Aggregate	Aggregate	Diesel	1026.912962	0.22%	24071.54778	0.13%	11871.1138	0.48%
SJCOG	2016	T6 Instate Other Class 7	Aggregate	Aggregate	Natural Gas	0.058384798	0.00%	2.389167579	0.00%	0.67492826	0.00%
SJCOG	2016	T6 Instate Tractor Class 6	Aggregate	Aggregate	Diesel	10.50468889	0.00%	467.597365	0.00%	121.434204	0.00%
SJCOG	2016	T6 Instate Tractor Class 7	Aggregate	Aggregate	Diesel	562.9679387	0.12%	40353.2635	0.22%	6507.90937	0.26%
SJCOG	2016	T6 Instate Tractor Class 7	Aggregate	Aggregate	Natural Gas	0.031112486	0.00%	3.520893584	0.00%	0.35966034	0.00%
SJCOG	2016	T6 OOS Class 4	Aggregate	Aggregate	Diesel	4.737193295	0.00%	359.0631656	0.00%	108.860702	0.00%
SJCOG	2016	T6 OOS Class 5	Aggregate	Aggregate	Diesel	6.144132219	0.00%	492.5700952	0.00%	141.192158	0.01%
SJCOG	2016	T6 OOS Class 6	Aggregate	Aggregate	Diesel	15.88044892	0.00%	1287.099751	0.01%	364.932716	0.01%
SJCOG	2016	T6 OOS Class 7	Aggregate	Aggregate	Diesel	51.78176219	0.01%	9358.815687	0.05%	1189.9449	0.05%
SJCOG	2016	T6 Public Class 4	Aggregate	Aggregate	Diesel	53.23384601	0.01%	1003.852762	0.01%	273.08963	0.01%
SJCOG	2016	T6 Public Class 4	Aggregate	Aggregate	Natural Gas	0.518893237	0.00%	12.07423438	0.00%	2.66192231	0.00%
SJCOG	2016	T6 Public Class 5	Aggregate	Aggregate	Diesel	72.32704997	0.02%	2769.650974	0.01%	371.037766	0.02%
SJCOG	2016	T6 Public Class 5	Aggregate	Aggregate	Natural Gas	1.804112644	0.00%	76.80861674	0.00%	9.25509786	0.00%
SJCOG	2016	T6 Public Class 6	Aggregate	Aggregate	Diesel	75.99059256	0.02%	4286.29603	0.02%	389.83174	0.02%
SJCOG	2016	T6 Public Class 6	Aggregate	Aggregate	Natural Gas	0.814598627	0.00%	59.314828	0.00%	4.17889096	0.00%

SCENARIO	SJCOG 2016 - RUNEX

Source	EMFAC2021 (v1.0.2) Emission Rates
Region Type	MPO
Region	SJCOG
Calendar Year	2016
Season	Annual
Vehicle Classification	EMFAC202x Categories
Emissions Rate and Vehicle Activity Units	Units: miles/day for VMT, g/mile for RUNEX

Daily VMT	17,015,116

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	CO_2 RUNEX	CH_4 RUNEX	N_2O RUNEX	Fleet Mix (by VMT)	VMT per Day	CO_2 RUNEX Emissions (MT/day)	CH_4 RUNEX Emissions (MT/day)	N_2O RUNEX Emissions (MT/day)
SJCOG	2016	All Other Buses	Aggregate	Aggregate	Diesel	1299.057254	0.068366146	0.204293694	0.02%	2,971.90	3.86E+00	2.03E-04	6.07E-04
SJCOG	2016	LDA	Aggregate	Aggregate	Gasoline	320.3616427	0.007844168	0.010520629	50.95%	8,669,883.76	2.78E+03	6.80E-02	9.12E-02
SJCOG	2016	LDA	Aggregate	Aggregate	Diesel	245.6464174	0.001769159	0.038631102	0.26%	43,402.55	1.07E+01	7.68E-05	1.68E-03
SJCOG	2016	LDA	Aggregate	Aggregate	Electricity	0	0	0	0.13%	22,688.52	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	LDA	Aggregate	Aggregate	Plug-in Hybrid	161.6650538	0.000580881	0.000727446	0.39%	67,036.67	1.08E+01	3.89E-05	4.88E-05
SJCOG	2016	LDT1	Aggregate	Aggregate	Gasoline	374.3904885	0.019975803	0.022052938	4.46%	758,899.24	2.84E+02	1.52E-02	1.67E-02
SJCOG	2016	LDT1	Aggregate	Aggregate	Diesel	448.4888408	0.010238709	0.070530719	0.00%	690.13	3.10E-01	7.07E-06	4.87E-05
SJCOG	2016	LDT1	Aggregate	Aggregate	Electricity	0	0	0	0.00%	183.61	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	LDT2	Aggregate	Aggregate	Gasoline	422.7046178	0.011388641	0.017855109	15.58%	2,651,085.54	1.12E+03	3.02E-02	4.73E-02
SJCOG	2016	LDT2	Aggregate	Aggregate	Diesel	343.8272663	0.001686343	0.054071321	0.03%	5,805.16	2.00E+00	9.79E-06	3.14E-04
SJCOG	2016	LDT2	Aggregate	Aggregate	Electricity	0	0	0	0.00%	186.77	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	LDT2	Aggregate	Aggregate	Plug-in Hybrid	161.7983446	0.000584329	0.00073534	0.00%	381.82	6.18E-02	2.23E-07	2.81E-07
SJCOG	2016	LHD1	Aggregate	Aggregate	Gasoline	1022.744534	0.027585766	0.028253452	1.56%	265,236.66	2.71E+02	7.32E-03	7.49E-03
SJCOG	2016	LHD1	Aggregate	Aggregate	Diesel	634.289503	0.013895695	0.099750296	1.84%	313,153.51	1.99E+02	4.35E-03	3.12E-02
SJCOG	2016	LHD2	Aggregate	Aggregate	Gasoline	1141.481793	0.020676247	0.025518158	0.20%	33,328.39	3.80E+01	6.89E-04	8.50E-04
SJCOG	2016	LHD2	Aggregate	Aggregate	Diesel	795.7784531	0.011779422	0.125146539	0.55%	93,436.96	7.44E+01	1.10E-03	1.17E-02
SJCOG	2016	MCY	Aggregate	Aggregate	Gasoline	198.795863	0.252295433	0.049509869	0.41%	69,729.43	1.39E+01	1.76E-02	3.45E-03
SJCOG	2016	MDV	Aggregate	Aggregate	Gasoline	501.7289874	0.01409112	0.022517632	15.54%	2,644,188.55	1.33E+03	3.73E-02	5.95E-02
SJCOG	2016	MDV	Aggregate	Aggregate	Diesel	441.5363694	0.00093178	0.069437352	0.24%	40,555.91	1.79E+01	3.78E-05	2.82E-03
SJCOG	2016	MDV	Aggregate	Aggregate	Electricity	0	0	0	0.00%	19.76	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	MDV	Aggregate	Aggregate	Plug-in Hybrid	161.8201239	0.000583336	0.000733074	0.01%	1,795.20	2.90E-01	1.05E-06	1.32E-06
SJCOG	2016	MH	Aggregate	Aggregate	Gasoline	1953.607878	0.034690017	0.044076707	0.09%	15,449.52	3.02E+01	5.36E-04	6.81E-04
SJCOG	2016	MH	Aggregate	Aggregate	Diesel	1075.873669	0.007217998	0.169195164	0.03%	5,378.72	5.79E+00	3.88E-05	9.10E-04
SJCOG	2016	Motor Coach	Aggregate	Aggregate	Diesel	1691.062988	0.017178811	0.265941707	0.01%	2,184.97	3.69E+00	3.75E-05	5.81E-04
SJCOG	2016	OBUS	Aggregate	Aggregate	Gasoline	1879.426477	0.037130488	0.055005697	0.06%	10,326.24	1.94E+01	3.83E-04	5.68E-04
SJCOG	2016	PTO	Aggregate	Aggregate	Diesel	2246.734896	0.030131011	0.353328361	0.10%	16,886.40	3.79E+01	5.09E-04	5.97E-03
SJCOG	2016	SBUS	Aggregate	Aggregate	Gasoline	898.8333176	0.142806349	0.072139412	0.01%	2,036.60	1.83E+00	2.91E-04	1.47E-04
SJCOG	2016	SBUS	Aggregate	Aggregate	Diesel	1165.371545	0.004391464	0.183269872	0.06%	10,546.54	1.23E+01	4.63E-05	1.93E-03
SJCOG	2016	SBUS	Aggregate	Aggregate	Natural Gas	1343.885959	3.768567343	0.273959944	0.01%	1,245.86	1.67E+00	4.70E-03	3.41E-04
SJCOG	2016	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	1090.623689	0.006296841	0.171514797	0.00%	577.76	6.30E-01	3.64E-06	9.91E-05
SJCOG	2016	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	1090.623689	0.006296841	0.171514797	0.00%	792.58	8.64E-01	4.99E-06	1.36E-04
SJCOG	2016	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	1090.623689	0.006296841	0.171514797	0.01%	2,071.04	2.26E+00	1.30E-05	3.55E-04
SJCOG	2016	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	1046.142754	0.006191374	0.16451959	0.08%	12,990.62	1.36E+01	8.04E-05	2.14E-03
SJCOG	2016	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	1266.705617	0.028006316	0.199205977	0.04%	6,981.56	8.84E+00	1.96E-04	1.39E-03
SJCOG	2016	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	1266.714187	0.02801132	0.199207324	0.03%	4,541.16	5.75E+00	1.27E-04	9.05E-04
SJCOG	2016	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	1266.697007	0.028001288	0.199204623	0.12%	19,707.72	2.50E+01	5.52E-04	3.93E-03
SJCOG	2016	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	1281.345213	0.028068783	0.201508244	0.03%	5,919.54	7.58E+00	1.66E-04	1.19E-03
SJCOG	2016	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	1054.872764	0.72676944	0.215042714	0.00%	0.37	3.87E-04	2.67E-07	7.89E-08
SJCOG	2016	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	1173.263538	0.02006513	0.184510991	0.09%	15,516.32	1.82E+01	3.11E-04	2.86E-03
SJCOG	2016	T6 Instate Other Class 5	Aggregate	Aggregate	Diesel	1173.098124	0.019948494	0.184484978	0.26%	43,807.78	5.14E+01	8.74E-04	8.08E-03
SJCOG	2016	T6 Instate Other Class 6	Aggregate	Aggregate	Diesel	1173.64164	0.020338441	0.184570453	0.19%	32,537.68	3.82E+01	6.62E-04	6.01E-03
SJCOG	2016	T6 Instate Other Class 7	Aggregate	Aggregate	Diesel	1174.150398	0.017506595	0.184650462	0.13%	22,176.42	2.60E+01	3.88E-04	4.09E-03
SJCOG	2016	T6 Instate Other Class 7	Aggregate	Aggregate	Natural Gas	916.549843	0.555313983	0.186844681	0.00%	2.20	2.02E-03	1.22E-06	4.11E-07
SJCOG	2016	T6 Instate Tractor Class 6	Aggregate	Aggregate	Diesel	1171.022292	0.019124261	0.184158526	0.00%	430.78	5.04E-01	8.24E-06	7.93E-05
SJCOG	2016	T6 Instate Tractor Class 7	Aggregate	Aggregate	Diesel	1148.847759	0.019675982	0.180671292	0.22%	37,176.29	4.27E+01	7.31E-04	6.72E-03
SJCOG	2016	T6 Instate Tractor Class 7	Aggregate	Aggregate	Natural Gas	916.549843	0.555313983	0.186844681	0.00%	3.24	2.97E-03	1.80E-06	6.06E-07
SJCOG	2016	T6 OOS Class 4	Aggregate	Aggregate	Diesel	1090.618249	0.006311237	0.171513942	0.00%	330.79	3.61E-01	2.09E-06	5.67E-05
SJCOG	2016	T6 OOS Class 5	Aggregate	Aggregate	Diesel	1090.618249	0.006311237	0.171513942	0.00%	453.79	4.95E-01	2.86E-06	7.78E-05
SJCOG	2016	T6 OOS Class 6	Aggregate	Aggregate	Diesel	1090.618249	0.006311237	0.171513942	0.01%	1,185.77	1.29E+00	7.48E-06	2.03E-04
SJCOG	2016	T6 OOS Class 7	Aggregate	Aggregate	Diesel	1046.210871	0.006743133	0.164530303	0.05%	8,622.00	9.02E+00	5.81E-05	1.42E-03
SJCOG	2016	T6 Public Class 4	Aggregate	Aggregate	Diesel	1281.254923	0.004699268	0.201494045	0.01%	924.82	1.18E+00	4.35E-06	1.86E-04
SJCOG	2016	T6 Public Class 4	Aggregate	Aggregate	Natural Gas	1043.985294	0.772382609	0.212823232	0.00%	11.12	1.16E-02	8.59E-06	2.37E-06
SJCOG	2016	T6 Public Class 5	Aggregate	Aggregate	Diesel	1255.42934	0.003390962	0.197432635	0.01%	2,551.60	3.20E+00	8.65E-06	5.04E-04
SJCOG	2016	T6 Public Class 5	Aggregate	Aggregate	Natural Gas	1043.456332	0.772382609	0.212715399	0.00%	70.76	7.38E-02	5.47E-05	1.51E-05
SJCOG	2016	T6 Public Class 6	Aggregate	Aggregate	Diesel	1305.855775	0.006431499	0.205362849	0.02%	3,948.84	5.16E+00	2.54E-05	8.11E-04
SJCOG	2016	T6 Public Class 6	Aggregate	Aggregate	Natural Gas	1042.755288	0.772382609	0.212572487	0.00%	54.65	5.70E-02	4.22E-05	1.16E-05

SCENARIO	SJCOG 2016 - STREX and IDLEX

Source	EMFAC2021 (v1.0.2) Emission Rates
Region Type	MPO
Region	SJCOG
Calendar Year	2016
Season	Annual
Vehicle Classification	EMFAC202x Categories
Emissions Rate and Vehicle Activity Units	Units: miles/day for VMT, g/mile for RUNEX

Daily Trips	2,276,639
Daily Vehicles	435,231

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	CO_2 IDLEX	CO_2 STREX	CH_4 IDLEX	CH_4 STREX	N_2O IDLEX	N_2O STREX	Fleet Mix (by Vehicle Trips)	Vehicle Trips per Day	Fleet Mix (by Vehicle Population)	Vehicles per Day	CO_2 STREX Emissions (tons/day)	CO_2 IDLEX Emissions (MT/day)	CH_4 STREX Emissions (MT/day)	CH_4 IDLEX Emissions (MT/day)	N_2O STREX Emissions (MT/day)	N_2O IDLEX Emissions (MT/day)
SJCOG	2016	All Other Buses	Aggregate	Aggregate	Diesel	660.435152	0	0.032614986	0	0.10386204	0	0.03%	581.41	0.02%	65.33	0.00E+00	4.31E-02	0.00E+00	2.13E-06	0.00E+00	6.79E-06
SJCOG	2016	LDA	Aggregate	Aggregate	Gasoline	0	83.68767196	0	0.127450533	0	0.042776239	43.45%	989,114.70	49.06%	213,536.45	8.28E+01	0.00E+00	1.26E-01	0.00E+00	4.23E-02	0.00E+00
SJCOG	2016	LDA	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.22%	4,957.32	0.25%	1,087.11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	LDA	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.14%	3,296.84	0.15%	648.06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	LDA	Aggregate	Aggregate	Plug-in Hybrid	0	69.74879907	0	0.043173542	0	0.02182133	0.23%	5,145.80	0.29%	1,244.45	3.59E-01	0.00E+00	2.22E-04	0.00E+00	1.12E-04	0.00E+00
SJCOG	2016	LDT1	Aggregate	Aggregate	Gasoline	0	106.782497	0	0.203102442	0	0.052314724	4.32%	98,438.21	5.17%	22,506.67	1.05E+01	0.00E+00	2.00E-02	0.00E+00	5.15E-03	0.00E+00
SJCOG	2016	LDT1	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.01%	127.63	0.01%	35.80	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	LDT1	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.00%	33.61	0.00%	7.39	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	LDT2	Aggregate	Aggregate	Gasoline	0	112.1692714	0	0.165293185	0	0.060963038	14.13%	321,665.77	16.17%	70,367.13	3.61E+01	0.00E+00	5.32E-02	0.00E+00	1.96E-02	0.00E+00
SJCOG	2016	LDT2	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.03%	598.27	0.03%	125.77	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	LDT2	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.00%	33.74	0.00%	7.36	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	LDT2	Aggregate	Aggregate	Plug-in Hybrid	0	86.37354889	0	0.043439092	0	0.022066757	0.00%	27.81	0.00%	6.73	2.40E-03	0.00E+00	1.21E-06	0.00E+00	6.14E-07	0.00E+00
SJCOG	2016	LHD1	Aggregate	Aggregate	Gasoline	125.087288	24.58793505	0.12039838	0.047794749	0.002853567	0.049654195	5.30%	120,676.69	1.86%	8,099.92	2.97E+00	1.01E+00	5.77E-03	9.75E-04	5.99E-03	2.31E-05
SJCOG	2016	LHD1	Aggregate	Aggregate	Diesel	142.2592021	0	0.005098128	0	0.022372115	0	4.58%	104,177.30	1.90%	8,282.01	0.00E+00	1.18E+00	0.00E+00	4.22E-05	0.00E+00	1.85E-04
SJCOG	2016	LHD2	Aggregate	Aggregate	Gasoline	144.2107723	26.89229087	0.123263154	0.043716347	0.002948525	0.051940839	0.64%	14,570.15	0.22%	977.96	3.92E-01	1.41E-01	6.37E-04	1.21E-04	7.57E-04	2.88E-06
SJCOG	2016	LHD2	Aggregate	Aggregate	Diesel	227.525021	0	0.005098128	0	0.035781277	0	1.30%	29,572.57	0.54%	2,351.00	0.00E+00	5.35E-01	0.00E+00	1.20E-05	0.00E+00	8.41E-05
SJCOG	2016	MCY	Aggregate	Aggregate	Gasoline	0	63.38032723	0	0.247115893	0	0.012368341	1.02%	23,180.37	2.66%	11,590.19	1.47E+00	0.00E+00	5.73E-03	0.00E+00	2.87E-04	0.00E+00
SJCOG	2016	MDV	Aggregate	Aggregate	Gasoline	0	131.4587019	0	0.216383964	0	0.070453663	15.26%	347,384.51	17.61%	76,648.82	4.57E+01	0.00E+00	7.52E-02	0.00E+00	2.45E-02	0.00E+00
SJCOG	2016	MDV	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.19%	4,250.60	0.20%	867.20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	MDV	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.00%	4.02	0.00%	0.92	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	MDV	Aggregate	Aggregate	Plug-in Hybrid	0	104.4691523	0	0.043367047	0	0.022000369	0.01%	132.70	0.01%	32.09	1.39E-02	0.00E+00	5.75E-06	0.00E+00	2.92E-06	0.00E+00
SJCOG	2016	MH	Aggregate	Aggregate	Gasoline	0	34.23090768	0	0.046795581	0	0.033198169	0.01%	184.04	0.42%	1,839.62	6.30E-03	0.00E+00	8.61E-06	0.00E+00	6.11E-06	0.00E+00
SJCOG	2016	MH	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.00%	55.66	0.13%	556.62	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	Motor Coach	Aggregate	Aggregate	Diesel	11546.02881	0	0.408749443	0	1.815763596	0	0.02%	403.69	0.00%	17.57	0.00E+00	2.03E-01	0.00E+00	7.18E-06	0.00E+00	3.19E-05
SJCOG	2016	OBUS	Aggregate	Aggregate	Gasoline	392.1302278	35.90440468	0.184698291	0.046757393	0.004566865	0.02996406	0.17%	3,831.31	0.04%	191.49	1.38E-01	7.51E-02	1.79E-04	3.54E-05	1.15E-04	8.75E-07
SJCOG	2016	PTO	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.00%	-	0.00%	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2016	SBUS	Aggregate	Aggregate	Gasoline	2721.303364	71.47023417	2.178763323	0.155650311	0.068316775	0.049241344	0.01%	148.79	0.01%	37.20	1.06E-02	1.01E-01	2.32E-05	8.10E-05	7.33E-06	2.54E-06
SJCOG	2016	SBUS	Aggregate	Aggregate	Diesel	2362.323963	0	0.009571068	0	0.371506249	0	0.32%	7,243.98	0.11%	500.27	0.00E+00	1.18E+00	0.00E+00	4.79E-06	0.00E+00	1.86E-04
SJCOG	2016	SBUS	Aggregate	Aggregate	Natural Gas	4066.534644	0	16.2278889	0	0.828989689	0	0.03%	776.57	0.01%	53.63	0.00E+00	2.18E-01	0.00E+00	8.70E-04	0.00E+00	4.45E-05
SJCOG	2016	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	687.0538768	0	0.006688211	0	0.108048182	0	0.01%	174.87	0.00%	7.61	0.00E+00	5.23E-03	0.00E+00	5.09E-08	0.00E+00	8.22E-07
SJCOG	2016	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	687.0538769	0	0.006688211	0	0.108048182	0	0.01%	226.66	0.00%	9.86	0.00E+00	6.78E-03	0.00E+00	6.60E-08	0.00E+00	1.07E-06
SJCOG	2016	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	687.053878	0	0.006688211	0	0.108048182	0	0.03%	585.97	0.01%	25.50	0.00E+00	1.75E-02	0.00E+00	1.71E-07	0.00E+00	2.76E-06
SJCOG	2016	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	675.2704127	0	0.007197062	0	0.106195078	0	0.08%	1,912.15	0.02%	83.21	0.00E+00	5.62E-02	0.00E+00	5.99E-07	0.00E+00	8.84E-06
SJCOG	2016	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	2296.278148	0	0.045381736	0	0.361119683	0	0.17%	3,849.13	0.06%	269.74	0.00E+00	6.19E-01	0.00E+00	1.22E-05	0.00E+00	9.74E-05
SJCOG	2016	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	2296.278148	0	0.045381736	0	0.361119683	0	0.12%	2,812.35	0.05%	197.08	0.00E+00	4.53E-01	0.00E+00	8.94E-06	0.00E+00	7.12E-05
SJCOG	2016	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	2296.278148	0	0.045381736	0	0.361119683	0	0.42%	9,519.37	0.15%	667.09	0.00E+00	1.53E+00	0.00E+00	3.03E-05	0.00E+00	2.41E-04
SJCOG	2016	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	2294.983356	0	0.05074704	0	0.36091606	0	0.18%	4,191.18	0.07%	293.71	0.00E+00	6.74E-01	0.00E+00	1.49E-05	0.00E+00	1.06E-04
SJCOG	2016	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	3887.344155	0	16.20015747	0	0.792460536	0	0.00%	0.25	0.00%	0.02	0.00E+00	6.67E-05	0.00E+00	2.78E-07	0.00E+00	1.36E-08
SJCOG	2016	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	2467.189675	0	0.049376373	0	0.38799775	0	0.27%	6,232.31	0.12%	539.13	0.00E+00	1.33E+00	0.00E+00	2.66E-05	0.00E+00	2.09E-04
SJCOG	2016	T6 Instate Other Class 5	Aggregate	Aggregate	Diesel	2467.787489	0	0.049073587	0	0.388091764	0	0.44%	9,923.72	0.20%	858.45	0.00E+00	2.12E+00	0.00E+00	4.21E-05	0.00E+00	3.33E-04
SJCOG	2016	T6 Instate Other Class 6	Aggregate	Aggregate	Diesel	2465.455435	0	0.050254747	0	0.387725018	0	0.43%	9,835.18	0.20%	850.79	0.00E+00	2.10E+00	0.00E+00	4.28E-05	0.00E+00	3.30E-04
SJCOG	2016	T6 Instate Other Class 7	Aggregate	Aggregate	Diesel	2463.358071	0	0.056590559	0	0.38739518	0	0.48%	10,936.51	0.22%	946.07	0.00E+00	2.33E+00	0.00E+00	5.35E-05	0.00E+00	3.67E-04
SJCOG	2016	T6 Instate Other Class 7	Aggregate	Aggregate	Natural Gas	4178.66285	0	17.41420195	0	0.851847758	0	0.00%	0.62	0.00%	0.05	0.00E+00	2.25E-04	0.00E+00	9.37E-07	0.00E+00	4.58E-08
SJCOG	2016	T6 Instate Tractor Class 6	Aggregate	Aggregate	Diesel	2462.279993	0	0.051863073	0	0.387225638	0	0.00%	111.87	0.00%	9.68	0.00E+00	2.38E-02	0.00E+00	5.02E-07	0.00E+00	3.75E-06
SJCOG	2016	T6 Instate Tractor Class 7	Aggregate	Aggregate	Diesel	2461.412544	0	0.05714975	0	0.3870922	0	0.26%	5,995.55	0.12%	518.65	0.00E+00	1.28E+00	0.00E+00	2.96E-05	0.00E+00	2.01E-04
SJCOG	2016	T6 Instate Tractor Class 7	Aggregate	Aggregate	Natural Gas	4178.66285	0	17.41420195	0	0.851847758	0	0.00%	0.33	0.00%	0.03	0.00E+00	1.20E-04	0.00E+00	4.99E-07	0.00E+00	2.44E-08
SJCOG	2016	T6 OOS Class 4	Aggregate	Aggregate	Diesel	687.0101579	0	0.0067152	0	0.108041306	0	0.00%	100.29	0.00%	4.36	0.00E+00	3.00E-03	0.00E+00	2.93E-08	0.00E+00	4.72E-07
SJCOG	2016	T6 OOS Class 5	Aggregate	Aggregate	Diesel	687.0101579	0	0.0067152	0	0.108041306	0	0.01%	130.08	0.00%	5.66	0.00E+00	3.89E-03	0.00E+00	3.80E-08	0.00E+00	6.12E-07
SJCOG	2016	T6 OOS Class 6	Aggregate	Aggregate	Diesel	687.0101579	0	0.0067152	0	0.108041306	0	0.01%	336.20	0.00%	14.63	0.00E+00	1.01E-02	0.00E+00	9.82E-08	0.00E+00	1.58E-06
SJCOG	2016	T6 OOS Class 7	Aggregate	Aggregate	Diesel	675.0663685	0	0.007351812	0	0.10616299	0	0.05%	1,096.26	0.01%	47.71	0.00E+00	3.22E-02	0.00E+00	3.51E-07	0.00E+00	5.06E-06
SJCOG	2016	T6 Public Class 4	Aggregate	Aggregate	Diesel	3644.202446	0	0.014263668	0	0.573098357	0	0.01%	251.59	0.01%	49.04	0.00E+00	1.79E-01	0.00E+00	7.00E-07	0.00E+00	2.81E-05
SJCOG	2016	T6 Public Class 4	Aggregate	Aggregate	Natural Gas	6142.758957	0	25.08746105	0	1.252241598	0	0.00%	2.45	0.00%	0.48	0.00E+00	2.94E-03	0.00E+00	1.20E-05	0.00E+00	5.99E-07
SJCOG	2016	T6 Public Class 5	Aggregate	Aggregate	Diesel	3688.226778	0	0.01302025	0	0.580021757	0	0.02%	341.83	0.02%	66.63	0.00E+00	2.46E-01	0.00E+00	8.68E-07	0.00E+00	3.86E-05
SJCOG	2016	T6 Public Class 5	Aggregate	Aggregate	Natural Gas	6139.670511	0	25.08746105	0	1.251611998	0	0.00%	8.53	0.00%	1.66	0.00E+00	1.02E-02	0.00E+00	4.17E-05	0.00E+00	2.08E-06
SJCOG	2016	T6 Public Class 6	Aggregate	Aggregate	Diesel	3453.85708	0	0.027250886	0	0.543164066	0	0.02%	359.14	0.02%	70.01	0.00E+00	2.42E-01	0.00E+00	1.91E-06	0.00E+00	3.80E-05
SJCOG	2016	T6 Public Class 6	Aggregate	Aggregate	Natural Gas	6135.81927	0	25.08746105	0	1.250826897	0	0.00%	3.85	0.00%	0.75	0.00E+00	4.60E-03	0.00E+00	1.88E-05	0.00E+00	9.39E-07
SJCOG	2016	T6 Public Class 7	Aggregate	Aggregate	Diesel	3340.250901	0	0.03382178	0	0.525298013	0	0.04%	860.46	0.04%	167.73	0.00E+00	5.60E-01	0.00E+00	5.67E-06	0.00E+00	8.81E-05

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: MPO
Region: SJCOG
Calendar Year: 2046
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Fleet Mix (Population)	VMT	Fleet Mix (VMT)	Trips	Fleet Mix (Trips)
SJCOG	2046	All Other Buses	Aggregate	Aggregate	Diesel	90.81477473	0.01%	4043.601801	0.01%	808.2514951	0.02%
SJCOG	2046	All Other Buses	Aggregate	Aggregate	Natural Gas	7.090857819	0.00%	297.5758322	0.00%	63.10863459	0.00%
SJCOG	2046	LDA	Aggregate	Aggregate	Gasoline	286532.7909	41.52%	11274357.16	41.45%	1322687.54	36.86%
SJCOG	2046	LDA	Aggregate	Aggregate	Diesel	184.8109957	0.03%	6572.028666	0.02%	822.0372827	0.02%
SJCOG	2046	LDA	Aggregate	Aggregate	Electricity	39034.6347	5.66%	1468923.127	5.40%	182226.5558	5.08%
SJCOG	2046	LDA	Aggregate	Aggregate	Plug-in Hyb	13462.5408	1.95%	532153.1043	1.96%	55667.60623	1.55%
SJCOG	2046	LDT1	Aggregate	Aggregate	Gasoline	18551.31407	2.69%	667608.4113	2.45%	83592.51067	2.33%
SJCOG	2046	LDT1	Aggregate	Aggregate	Diesel	0.208701503	0.00%	7.907281359	0.00%	0.962223893	0.00%
SJCOG	2046	LDT1	Aggregate	Aggregate	Electricity	535.7018807	0.08%	20330.37118	0.07%	2509.004559	0.07%
SJCOG	2046	LDT1	Aggregate	Aggregate	Plug-in Hyb	411.5528799	0.06%	16158.04305	0.06%	1701.771159	0.05%
SJCOG	2046	LDT2	Aggregate	Aggregate	Gasoline	156798.3121	22.72%	5903011.656	21.70%	719213.528	20.04%
SJCOG	2046	LDT2	Aggregate	Aggregate	Diesel	591.6603512	0.09%	22518.19929	0.08%	2728.562708	0.08%
SJCOG	2046	LDT2	Aggregate	Aggregate	Electricity	6122.088538	0.89%	160554.4421	0.59%	28657.65056	0.80%
SJCOG	2046	LDT2	Aggregate	Aggregate	Plug-in Hyb	4216.316495	0.61%	162296.9788	0.60%	17434.46871	0.49%
SJCOG	2046	LHD1	Aggregate	Aggregate	Gasoline	5912.797166	0.86%	197922.584	0.73%	88091.8677	2.46%
SJCOG	2046	LHD1	Aggregate	Aggregate	Diesel	3881.583424	0.56%	122657.7199	0.45%	48825.43644	1.36%
SJCOG	2046	LHD1	Aggregate	Aggregate	Electricity	6197.800296	0.90%	259481.945	0.95%	87212.46534	2.43%
SJCOG	2046	LHD2	Aggregate	Aggregate	Gasoline	622.109093	0.09%	20509.84666	0.08%	9268.498543	0.26%
SJCOG	2046	LHD2	Aggregate	Aggregate	Diesel	1931.689394	0.28%	58232.74214	0.21%	24298.22251	0.68%
SJCOG	2046	LHD2	Aggregate	Aggregate	Electricity	1442.519696	0.21%	58990.97841	0.22%	19089.9362	0.53%
SJCOG	2046	MCY	Aggregate	Aggregate	Gasoline	12065.7259	1.75%	63095.31945	0.23%	24131.45181	0.67%
SJCOG	2046	MDV	Aggregate	Aggregate	Gasoline	93408.11546	13.53%	3263239.219	12.00%	423148.8177	11.79%
SJCOG	2046	MDV	Aggregate	Aggregate	Diesel	1044.900216	0.15%	35735.03962	0.13%	4698.533817	0.13%
SJCOG	2046	MDV	Aggregate	Aggregate	Electricity	5676.406922	0.82%	147142.0992	0.54%	26462.08235	0.74%
SJCOG	2046	MDV	Aggregate	Aggregate	Plug-in Hyb	2696.688651	0.39%	97889.18229	0.36%	11150.80757	0.31%
SJCOG	2046	MH	Aggregate	Aggregate	Gasoline	697.2375547	0.10%	7193.69432	0.03%	69.75164497	0.00%
SJCOG	2046	MH	Aggregate	Aggregate	Diesel	463.4076195	0.07%	4130.104457	0.02%	46.34076195	0.00%
SJCOG	2046	Motor Coach	Aggregate	Aggregate	Diesel	22.23670087	0.00%	2821.868368	0.01%	510.9993859	0.01%
SJCOG	2046	OBUS	Aggregate	Aggregate	Gasoline	79.91687087	0.01%	2816.14532	0.01%	1598.976752	0.04%
SJCOG	2046	OBUS	Aggregate	Aggregate	Electricity	49.15707398	0.01%	3369.571563	0.01%	983.5347362	0.03%
SJCOG	2046	PTO	Aggregate	Aggregate	Diesel	0	0.00%	14958.96735	0.05%	0	0.00%
SJCOG	2046	PTO	Aggregate	Aggregate	Electricity	0	0.00%	14892.47381	0.05%	0	0.00%
SJCOG	2046	SBUS	Aggregate	Aggregate	Gasoline	98.84520282	0.01%	5248.227792	0.02%	395.3808113	0.01%
SJCOG	2046	SBUS	Aggregate	Aggregate	Diesel	248.1531863	0.04%	5226.568204	0.02%	3593.258137	0.10%
SJCOG	2046	SBUS	Aggregate	Aggregate	Electricity	282.6773757	0.04%	7923.927246	0.03%	3774.26029	0.11%
SJCOG	2046	SBUS	Aggregate	Aggregate	Natural Gas	82.69222068	0.01%	1701.678281	0.01%	1197.383355	0.03%
SJCOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	6.424480825	0.00%	461.953152	0.00%	147.6345693	0.00%
SJCOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Electricity	8.770160597	0.00%	667.7379886	0.00%	201.5382905	0.01%
SJCOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	7.896321353	0.00%	634.6179463	0.00%	181.4574647	0.01%
SJCOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Electricity	10.74408818	0.00%	915.1151536	0.00%	246.8991464	0.01%
SJCOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	35.84269245	0.01%	1651.926359	0.01%	823.6650724	0.02%
SJCOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Electricity	49.24406089	0.01%	2397.570569	0.01%	1131.628519	0.03%
SJCOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	95.16572496	0.01%	19252.49208	0.07%	2186.90836	0.06%
SJCOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Electricity	29.27408702	0.00%	6147.999483	0.02%	672.7185198	0.02%
SJCOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	193.9236874	0.03%	6394.782412	0.02%	2767.291019	0.08%
SJCOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Electricity	205.7816949	0.03%	7256.214177	0.03%	2936.504786	0.08%
SJCOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	126.2770653	0.02%	4163.868916	0.02%	1801.973723	0.05%
SJCOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Electricity	133.6274202	0.02%	4715.434921	0.02%	1906.863287	0.05%
SJCOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	547.9266998	0.08%	18066.38116	0.07%	7818.914006	0.22%
SJCOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Electricity	580.2773921	0.08%	20468.00592	0.08%	8280.558386	0.23%
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	136.2407663	0.02%	6904.107439	0.03%	1944.155735	0.05%
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Electricity	82.41890576	0.01%	4430.065663	0.02%	1176.117785	0.03%
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	4.876209154	0.00%	240.9886564	0.00%	69.58350463	0.00%
SJCOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	356.4518153	0.05%	13815.15897	0.05%	4120.582985	0.11%
SJCOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Electricity	377.2118407	0.05%	16523.80333	0.06%	4360.568878	0.12%

SCENARIO	SJCOG 2046 RTP/SCS - RUNEX

Source	EMFAC2021 (v1.0.2) Emission Rates
Region Type	MPO
Region	SJCOG
Calendar Year	2046
Season	Annual
Vehicle Classification	EMFAC202X Categories
Emissions Rate and Vehicle Activity Units	Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip

Daily VMT	23,495,442

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	CO_2 RUNEX	CH_4 RUNEX	N_2O RUNEX	Fleet Mix	VMT per Day	CO_2 RUNEX Emissions (tons/day)	CH_4 RUNEX Emissions (tons/day)	N_2O RUNEX Emissions (tons/day)
SJCOG	2046	All Other Buses	Aggregate	Aggregate	Diesel	1038.084573	0.00203365	0.163550647	0.01%	3,492.65	3.63E+00	7.10E-06	5.71E-04
SJCOG	2046	All Other Buses	Aggregate	Aggregate	Natural Gas	909.8882056	0.857361068	0.185486663	0.00%	257.03	2.34E-01	2.20E-04	4.77E-05
SJCOG	2046	LDA	Aggregate	Aggregate	Gasoline	228.8750323	0.00111171	0.003308407	41.45%	9,738,197.68	2.23E+03	1.08E-02	3.22E-02
SJCOG	2046	LDA	Aggregate	Aggregate	Diesel	182.6673843	0.000288849	0.028779321	0.02%	5,676.57	1.04E+00	1.64E-06	1.63E-04
SJCOG	2046	LDA	Aggregate	Aggregate	Electricity	0	0	0	5.40%	1,268,778.66	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDA	Aggregate	Aggregate	Plug-in Hybrid	124.5669062	0.000425133	0.000495386	1.96%	459,645.91	5.73E+01	1.95E-04	2.28E-04
SJCOG	2046	LDT1	Aggregate	Aggregate	Gasoline	264.2279019	0.001182371	0.00341225	2.45%	576,645.09	1.52E+02	6.82E-04	1.97E-03
SJCOG	2046	LDT1	Aggregate	Aggregate	Diesel	341.0539736	0.000834156	0.053733192	0.00%	6.83	2.33E-03	5.70E-09	3.67E-07
SJCOG	2046	LDT1	Aggregate	Aggregate	Electricity	0	0	0	0.07%	17,560.31	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT1	Aggregate	Aggregate	Plug-in Hybrid	124.2263028	0.000423097	0.00049202	0.06%	13,956.47	1.73E+00	5.90E-06	6.87E-06
SJCOG	2046	LDT2	Aggregate	Aggregate	Gasoline	274.160281	0.001469529	0.003518728	21.70%	5,098,711.49	1.40E+03	7.49E-03	1.79E-02
SJCOG	2046	LDT2	Aggregate	Aggregate	Diesel	252.483571	0.000832457	0.039778889	0.08%	19,450.04	4.91E+00	1.62E-05	7.74E-04
SJCOG	2046	LDT2	Aggregate	Aggregate	Electricity	0	0	0	0.59%	138,678.50	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT2	Aggregate	Aggregate	Plug-in Hybrid	124.4394915	0.000422941	0.000490847	0.60%	140,183.61	1.74E+01	5.93E-05	6.88E-05
SJCOG	2046	LHD1	Aggregate	Aggregate	Gasoline	747.8832461	0.001198497	0.001673491	0.73%	170,955.13	1.28E+02	2.05E-04	2.86E-04
SJCOG	2046	LHD1	Aggregate	Aggregate	Diesel	603.0568573	0.004338534	0.095011853	0.45%	105,945.30	6.39E+01	4.60E-04	1.01E-02
SJCOG	2046	LHD1	Aggregate	Aggregate	Electricity	0	0	0	0.95%	224,126.88	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LHD2	Aggregate	Aggregate	Gasoline	842.6036056	0.001098063	0.002139618	0.08%	17,715.33	1.49E+01	1.95E-05	3.79E-05
SJCOG	2046	LHD2	Aggregate	Aggregate	Diesel	706.2186156	0.005464223	0.11126503	0.21%	50,298.38	3.55E+01	2.75E-04	5.60E-03
SJCOG	2046	LHD2	Aggregate	Aggregate	Electricity	0	0	0	0.22%	50,953.31	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	MCY	Aggregate	Aggregate	Gasoline	188.5213727	0.144517645	0.035878114	0.23%	54,498.42	1.03E+01	7.88E-03	1.96E-03
SJCOG	2046	MDV	Aggregate	Aggregate	Gasoline	332.6583179	0.001551813	0.003643339	12.00%	2,818,614.68	9.38E+02	4.37E-03	1.03E-02
SJCOG	2046	MDV	Aggregate	Aggregate	Diesel	329.5542307	0.000308478	0.051921403	0.13%	30,866.05	1.02E+01	9.52E-06	1.60E-03
SJCOG	2046	MDV	Aggregate	Aggregate	Electricity	0	0	0	0.54%	127,093.62	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	MDV	Aggregate	Aggregate	Plug-in Hybrid	124.496848	0.000420413	0.000484887	0.36%	84,551.54	1.05E+01	3.55E-05	4.10E-05
SJCOG	2046	MH	Aggregate	Aggregate	Gasoline	1947.468291	0.004058195	0.018831984	0.03%	6,213.54	1.21E+01	2.52E-05	1.17E-04
SJCOG	2046	MH	Aggregate	Aggregate	Diesel	1089.291744	0.004053637	0.171618358	0.02%	3,567.37	3.89E+00	1.45E-05	6.12E-04
SJCOG	2046	Motor Coach	Aggregate	Aggregate	Diesel	1528.724378	0.00048903	0.240851148	0.01%	2,437.38	3.73E+00	1.19E-06	5.87E-04
SJCOG	2046	OBUS	Aggregate	Aggregate	Gasoline	1535.331791	0.004872022	0.017364528	0.01%	2,432.44	3.73E+00	1.19E-05	4.22E-05
SJCOG	2046	OBUS	Aggregate	Aggregate	Electricity	0	0	0	0.01%	2,910.46	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	PTO	Aggregate	Aggregate	Diesel	1734.607319	0.000656568	0.273288089	0.05%	12,920.77	2.24E+01	8.48E-06	3.53E-03
SJCOG	2046	PTO	Aggregate	Aggregate	Electricity	0	0	0	0.05%	12,863.34	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	SBUS	Aggregate	Aggregate	Gasoline	751.4890514	0.001926092	0.014653605	0.02%	4,533.14	3.41E+00	8.73E-06	6.64E-05
SJCOG	2046	SBUS	Aggregate	Aggregate	Diesel	1032.901741	0.000336099	0.16273409	0.02%	4,514.44	4.66E+00	1.52E-06	7.35E-04
SJCOG	2046	SBUS	Aggregate	Aggregate	Electricity	0	0	0	0.03%	6,844.27	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	SBUS	Aggregate	Aggregate	Natural Gas	1073.903131	2.312953689	0.218922178	0.01%	1,469.82	1.58E+00	3.40E-03	3.22E-04
SJCOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	1014.044438	0.000246575	0.159763114	0.00%	399.01	4.05E-01	9.84E-08	6.37E-05
SJCOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Electricity	0	0	0	0.00%	576.76	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	1014.352623	0.00024695	0.159811669	0.00%	548.15	5.56E-01	1.35E-07	8.76E-05
SJCOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Electricity	0	0	0	0.00%	790.43	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	1013.22302	0.000246119	0.159633699	0.01%	1,426.85	1.45E+00	3.51E-07	2.28E-04
SJCOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Electricity	0	0	0	0.01%	2,070.90	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	895.3727102	0.00026566	0.141066335	0.07%	16,629.29	1.49E+01	4.42E-06	2.35E-03
SJCOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Electricity	0	0	0	0.02%	5,310.32	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	1044.095106	0.000279833	0.164497609	0.02%	5,523.48	5.77E+00	1.55E-06	9.09E-04
SJCOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Electricity	0	0	0	0.03%	6,267.54	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	1045.105798	0.000278547	0.164656844	0.02%	3,596.53	3.76E+00	1.00E-06	5.92E-04
SJCOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Electricity	0	0	0	0.02%	4,072.95	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	1044.464168	0.000280545	0.164555755	0.07%	15,604.79	1.63E+01	4.38E-06	2.57E-03
SJCOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Electricity	0	0	0	0.08%	17,679.19	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	1071.693652	0.000361304	0.168845771	0.03%	5,963.41	6.39E+00	2.15E-06	1.01E-03
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Electricity	0	0	0	0.02%	3,826.46	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	1059.255678	0.873011689	0.215936199	0.00%	208.15	2.20E-01	1.82E-04	4.49E-05
SJCOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	1011.621348	0.000252467	0.159381355	0.05%	11,932.81	1.21E+01	3.01E-06	1.90E-03
SJCOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Electricity	0	0	0	0.06%	14,272.39	0.00E+00	0.00E+00	0.00E+00

SCENARIO	SJCOG 2046 RTP/SCS - STREX and IDLEX

Source	EMFAC2021 (v1.0.2) Emission Rates
Region Type	MPO
Region	SJCOG
Calendar Year	2046
Season	Annual
Vehicle Classification	EMFAC202X Categories
Emissions Rate and Vehicle Activity Units	Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW,

Daily Trips	3,099,319
Daily Vehicles	595,927

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	CO_2 IDLEX	CO_2 STREX	CH_4 IDLEX	CH_4 STREX	N_2O IDLEX	N_2O STREX	Fleet Mix (by Vehicle Trips)	Vehicle Trips per Day	Fleet Mix (by Vehicle Population)	Vehicles per Day	CO_2 STREX Emissions (MT/day)	CO_2 IDLEX Emissions (MT/day)	CH_4 STREX Emissions (MT/day)	CH_4 IDLEX Emissions (MT/day)	N_2O STREX Emissions (MT/day)	N_2O IDLEX Emissions (MT/day)
SJCOG	2046	All Other Buses	Aggregate	Aggregate	Diesel	542.1735073	0	0.002465424	0	0.085419657	0	0.02%	698.13	0.01%	78.41	0.00E+00	4.25E-02	0.00E+00	1.93E-07	0.00E+00	6.70E-06
SJCOG	2046	All Other Buses	Aggregate	Aggregate	Natural Gas	1164.098467	0	3.418630584	0	0.237309088	0	0.00%	54.51	0.00%	6.12	0.00E+00	7.13E-03	0.00E+00	2.09E-05	0.00E+00	1.45E-06
SJCOG	2046	LDA	Aggregate	Aggregate	Gasoline	0	53.64868814	0	0.032118364	0	0.025846728	36.86%	1,142,467.79	41.52%	247,402.40	6.13E+01	0.00E+00	3.67E-02	0.00E+00	2.95E-02	0.00E+00
SJCOG	2046	LDA	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.02%	710.03	0.03%	159.57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDA	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	5.08%	157,397.70	5.66%	33,703.86	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDA	Aggregate	Aggregate	Plug-in Hybrid	0	55.58388033	0	0.04001405	0	0.018863459	1.55%	48,082.74	1.95%	11,624.03	2.67E+00	0.00E+00	1.92E-03	0.00E+00	9.07E-04	0.00E+00
SJCOG	2046	LDT1	Aggregate	Aggregate	Gasoline	0	62.57996998	0	0.034290615	0	0.027150962	2.33%	72,202.81	2.69%	16,017.85	4.52E+00	0.00E+00	2.48E-03	0.00E+00	1.96E-03	0.00E+00
SJCOG	2046	LDT1	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.00%	0.83	0.00%	0.18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT1	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.07%	2,167.15	0.08%	462.54	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT1	Aggregate	Aggregate	Plug-in Hybrid	0	63.58225659	0	0.040009783	0	0.018857271	0.05%	1,469.90	0.06%	355.35	9.35E-02	0.00E+00	5.88E-05	0.00E+00	2.77E-05	0.00E+00
SJCOG	2046	LDT2	Aggregate	Aggregate	Gasoline	0	65.78896704	0	0.041285813	0	0.030714052	20.04%	621,218.74	22.72%	135,385.13	4.09E+01	0.00E+00	2.56E-02	0.00E+00	1.91E-02	0.00E+00
SJCOG	2046	LDT2	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.08%	2,356.79	0.09%	510.86	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT2	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.80%	24,752.97	0.89%	5,286.02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT2	Aggregate	Aggregate	Plug-in Hybrid	0	66.86008497	0	0.039916473	0	0.018770668	0.49%	15,058.98	0.61%	3,640.51	1.01E+00	0.00E+00	6.01E-04	0.00E+00	2.83E-04	0.00E+00
SJCOG	2046	LHD1	Aggregate	Aggregate	Gasoline	107.5255318	23.63340716	0.083276907	0.019575603	0.002421507	0.038709334	2.46%	76,089.11	0.86%	5,105.32	1.80E+00	5.49E-01	1.49E-03	4.25E-04	2.95E-03	1.24E-05
SJCOG	2046	LHD1	Aggregate	Aggregate	Diesel	117.875715	0	0.005098128	0	0.018571367	0	1.36%	42,172.84	0.56%	3,351.49	0.00E+00	3.95E-01	0.00E+00	1.71E-05	0.00E+00	6.22E-05
SJCOG	2046	LHD1	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	2.43%	75,329.53	0.90%	5,351.40	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LHD2	Aggregate	Aggregate	Gasoline	123.9701391	23.28241304	0.073989608	0.017275996	0.002161247	0.034505216	0.26%	8,005.64	0.09%	537.15	1.86E-01	6.66E-02	1.38E-04	3.97E-05	2.76E-04	1.16E-06
SJCOG	2046	LHD2	Aggregate	Aggregate	Diesel	192.8692032	0	0.005098128	0	0.030386622	0	0.68%	20,987.52	0.28%	1,667.89	0.00E+00	3.22E-01	0.00E+00	8.50E-06	0.00E+00	5.07E-05
SJCOG	2046	LHD2	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.53%	16,488.88	0.21%	1,245.52	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	MCY	Aggregate	Aggregate	Gasoline	0	37.21074006	0	0.13048703	0	0.004518799	0.67%	20,843.48	1.75%	10,417.97	7.76E-01	0.00E+00	2.72E-03	0.00E+00	9.42E-05	0.00E+00
SJCOG	2046	MDV	Aggregate	Aggregate	Gasoline	0	80.63870493	0	0.043929627	0	0.03179331	11.79%	365,493.65	13.53%	80,651.82	2.95E+01	0.00E+00	1.61E-02	0.00E+00	1.16E-02	0.00E+00
SJCOG	2046	MDV	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.13%	4,058.35	0.15%	902.20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	MDV	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.74%	22,856.55	0.82%	4,901.21	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	MDV	Aggregate	Aggregate	Plug-in Hybrid	0	81.42192473	0	0.039601455	0	0.01847911	0.31%	9,631.48	0.39%	2,328.41	7.84E-01	0.00E+00	3.81E-04	0.00E+00	1.78E-04	0.00E+00
SJCOG	2046	MH	Aggregate	Aggregate	Gasoline	0	29.99876819	0	0.032376895	0	0.044540242	0.00%	60.25	0.10%	602.02	1.81E-03	0.00E+00	1.95E-06	0.00E+00	2.68E-06	0.00E+00
SJCOG	2046	MH	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.00%	40.03	0.07%	400.12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	Motor Coach	Aggregate	Aggregate	Diesel	8334.136335	0	0.185553219	0	1.313046574	0	0.01%	441.37	0.00%	19.20	0.00E+00	1.60E-01	0.00E+00	3.56E-06	0.00E+00	2.52E-05
SJCOG	2046	OBUS	Aggregate	Aggregate	Gasoline	348.1765503	27.99034512	0.191201835	0.031219987	0.003822927	0.025333207	0.04%	1,381.11	0.01%	69.00	3.87E-02	2.40E-02	4.31E-05	1.32E-05	3.50E-05	2.64E-07
SJCOG	2046	OBUS	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.03%	849.53	0.01%	42.44	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	PTO	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.00%	-	0.00%	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	PTO	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.00%	-	0.00%	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	SBUS	Aggregate	Aggregate	Gasoline	2418.960372	51.75760849	2.520359109	0.07003516	0.074526685	0.083497417	0.01%	341.51	0.01%	85.35	1.77E-02	2.06E-01	2.39E-05	2.15E-04	2.85E-05	6.36E-06
SJCOG	2046	SBUS	Aggregate	Aggregate	Diesel	1852.134074	0	0.007765252	0	0.291804478	0	0.10%	3,103.67	0.04%	214.26	0.00E+00	3.97E-01	0.00E+00	1.66E-06	0.00E+00	6.25E-05
SJCOG	2046	SBUS	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.11%	3,260.01	0.04%	244.07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	SBUS	Aggregate	Aggregate	Natural Gas	4312.463409	0	12.03381943	0	0.879123877	0	0.03%	1,034.24	0.01%	71.40	0.00E+00	3.08E-01	0.00E+00	8.59E-04	0.00E+00	6.28E-05
SJCOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	512.8588831	0	0.002291385	0	0.080801126	0	0.00%	127.52	0.00%	5.55	0.00E+00	2.84E-03	0.00E+00	1.27E-08	0.00E+00	4.48E-07
SJCOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.01%	174.08	0.00%	7.57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	513.1773188	0	0.002291414	0	0.080851296	0	0.01%	156.73	0.00%	6.82	0.00E+00	3.50E-03	0.00E+00	1.56E-08	0.00E+00	5.51E-07
SJCOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.01%	213.26	0.00%	9.28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	512.2101537	0	0.002291356	0	0.080698918	0	0.02%	711.44	0.01%	30.95	0.00E+00	1.59E-02	0.00E+00	7.09E-08	0.00E+00	2.50E-06
SJCOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.03%	977.44	0.01%	42.52	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	501.4463906	0	0.002291359	0	0.079003083	0	0.06%	1,888.94	0.01%	82.17	0.00E+00	4.12E-02	0.00E+00	1.88E-07	0.00E+00	6.49E-06
SJCOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.02%	581.06	0.00%	25.28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	1753.740487	0	0.007729557	0	0.276302528	0	0.08%	2,390.24	0.03%	167.44	0.00E+00	2.94E-01	0.00E+00	1.29E-06	0.00E+00	4.63E-05
SJCOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.08%	2,536.40	0.03%	177.68	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	1754.176942	0	0.007729104	0	0.276371292	0	0.05%	1,556.45	0.02%	109.03	0.00E+00	1.91E-01	0.00E+00	8.43E-07	0.00E+00	3.01E-05
SJCOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.05%	1,647.05	0.02%	115.38	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	1753.908982	0	0.0077297	0	0.276329074	0	0.22%	6,753.57	0.08%	473.10	0.00E+00	8.30E-01	0.00E+00	3.66E-06	0.00E+00	1.31E-04
SJCOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.23%	7,152.31	0.08%	501.03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	1831.983874	0	0.007738633	0	0.288629805	0	0.05%	1,679.26	0.02%	117.64	0.00E+00	2.16E-01	0.00E+00	9.10E-07	0.00E+00	3.40E-05
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.03%	1,015.87	0.01%	71.16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	4513.688465	0	11.39590967	0	0.920144921	0	0.00%	60.10	0.00%	4.21	0.00E+00	1.90E-02	0.00E+00	4.80E-05	0.00E+00	3.87E-06
SJCOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	1886.155045	0	0.008309927	0	0.297164495	0	0.11%	3,559.14	0.05%	307.77	0.00E+00	5.81E-01	0.00E+00	2.56E-06	0.00E+00	9.15E-05
SJCOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.12%	3,766.43	0.05%	325.70	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

SCENARIO	SJCOG 2046 RTP/SCS No Build - RUNEX

Source	EMFAC2021 (v1.0.2) Emission Rates
Region Type	MPO
Region	SJCOG
Calendar Year	2046
Season	Annual
Vehicle Classification	EMFAC202X Categories
Emissions Rate and Vehicle Activity Units	Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip

Daily VMT	23,220,752

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	CO_2 RUNEX	CH_4 RUNEX	N_2O RUNEX	Fleet Mix	VMT per Day	CO_2 RUNEX Emissions (tons/day)	CH_4 RUNEX Emissions (tons/day)	N_2O RUNEX Emissions (tons/day)
SJCOG	2046	All Other Buses	Aggregate	Aggregate	Diesel	1038.084573	0.00203365	0.163550647	0.01%	3,451.82	3.58E+00	7.02E-06	5.65E-04
SJCOG	2046	All Other Buses	Aggregate	Aggregate	Natural Gas	909.8882056	0.857361068	0.185486663	0.00%	254.03	2.31E-01	2.18E-04	4.71E-05
SJCOG	2046	LDA	Aggregate	Aggregate	Gasoline	228.8750323	0.00111171	0.003308407	41.45%	9,624,346.43	2.20E+03	1.07E-02	3.18E-02
SJCOG	2046	LDA	Aggregate	Aggregate	Diesel	182.6673843	0.000288849	0.028779321	0.02%	5,610.21	1.02E+00	1.62E-06	1.61E-04
SJCOG	2046	LDA	Aggregate	Aggregate	Electricity	0	0	0	5.40%	1,253,945.11	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDA	Aggregate	Aggregate	Plug-in Hybrid	124.5669062	0.000425133	0.000495386	1.96%	454,272.09	5.66E+01	1.93E-04	2.25E-04
SJCOG	2046	LDT1	Aggregate	Aggregate	Gasoline	264.2279019	0.001182371	0.00341225	2.45%	569,903.41	1.51E+02	6.74E-04	1.94E-03
SJCOG	2046	LDT1	Aggregate	Aggregate	Diesel	341.0539736	0.000834156	0.053733192	0.00%	6.75	2.30E-03	5.63E-09	3.63E-07
SJCOG	2046	LDT1	Aggregate	Aggregate	Electricity	0	0	0	0.07%	17,355.01	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT1	Aggregate	Aggregate	Plug-in Hybrid	124.2263028	0.000423097	0.00049202	0.06%	13,793.30	1.71E+00	5.84E-06	6.79E-06
SJCOG	2046	LDT2	Aggregate	Aggregate	Gasoline	274.160281	0.001469529	0.003518728	21.70%	5,039,101.42	1.38E+03	7.41E-03	1.77E-02
SJCOG	2046	LDT2	Aggregate	Aggregate	Diesel	252.483571	0.000832457	0.039778889	0.08%	19,222.64	4.85E+00	1.60E-05	7.65E-04
SJCOG	2046	LDT2	Aggregate	Aggregate	Electricity	0	0	0	0.59%	137,057.18	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT2	Aggregate	Aggregate	Plug-in Hybrid	124.4394915	0.000422941	0.000490847	0.60%	138,544.69	1.72E+01	5.86E-05	6.80E-05
SJCOG	2046	LHD1	Aggregate	Aggregate	Gasoline	747.8832461	0.001198497	0.001673491	0.73%	168,956.46	1.26E+02	2.02E-04	2.83E-04
SJCOG	2046	LHD1	Aggregate	Aggregate	Diesel	603.0568573	0.004338534	0.095011853	0.45%	104,706.67	6.31E+01	4.54E-04	9.95E-03
SJCOG	2046	LHD1	Aggregate	Aggregate	Electricity	0	0	0	0.95%	221,506.57	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LHD2	Aggregate	Aggregate	Gasoline	842.6036056	0.001098063	0.002139618	0.08%	17,508.22	1.48E+01	1.92E-05	3.75E-05
SJCOG	2046	LHD2	Aggregate	Aggregate	Diesel	706.2186156	0.005464223	0.11126503	0.21%	49,710.34	3.51E+01	2.72E-04	5.53E-03
SJCOG	2046	LHD2	Aggregate	Aggregate	Electricity	0	0	0	0.22%	50,357.60	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	MCY	Aggregate	Aggregate	Gasoline	188.5213727	0.144517645	0.035878114	0.23%	53,861.27	1.02E+01	7.78E-03	1.93E-03
SJCOG	2046	MDV	Aggregate	Aggregate	Gasoline	332.6583179	0.001551813	0.003643339	12.00%	2,785,661.68	9.27E+02	4.32E-03	1.01E-02
SJCOG	2046	MDV	Aggregate	Aggregate	Diesel	329.5542307	0.000308478	0.051921403	0.13%	30,505.19	1.01E+01	9.41E-06	1.58E-03
SJCOG	2046	MDV	Aggregate	Aggregate	Electricity	0	0	0	0.54%	125,607.74	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	MDV	Aggregate	Aggregate	Plug-in Hybrid	124.496848	0.000420413	0.000484887	0.36%	83,563.03	1.04E+01	3.51E-05	4.05E-05
SJCOG	2046	MH	Aggregate	Aggregate	Gasoline	1947.468291	0.004058195	0.018831984	0.03%	6,140.89	1.20E+01	2.49E-05	1.16E-04
SJCOG	2046	MH	Aggregate	Aggregate	Diesel	1089.291744	0.004053637	0.171618358	0.02%	3,525.66	3.84E+00	1.43E-05	6.05E-04
SJCOG	2046	Motor Coach	Aggregate	Aggregate	Diesel	1528.724378	0.00048903	0.240851148	0.01%	2,408.89	3.68E+00	1.18E-06	5.80E-04
SJCOG	2046	OBUS	Aggregate	Aggregate	Gasoline	1535.331791	0.004872022	0.017364528	0.01%	2,404.00	3.69E+00	1.17E-05	4.17E-05
SJCOG	2046	OBUS	Aggregate	Aggregate	Electricity	0	0	0	0.01%	2,876.43	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	PTO	Aggregate	Aggregate	Diesel	1734.607319	0.000656568	0.273288089	0.05%	12,769.71	2.22E+01	8.38E-06	3.49E-03
SJCOG	2046	PTO	Aggregate	Aggregate	Electricity	0	0	0	0.05%	12,712.95	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	SBUS	Aggregate	Aggregate	Gasoline	751.4890514	0.001926092	0.014653605	0.02%	4,480.15	3.37E+00	8.63E-06	6.57E-05
SJCOG	2046	SBUS	Aggregate	Aggregate	Diesel	1032.901741	0.000336099	0.16273409	0.02%	4,461.66	4.61E+00	1.50E-06	7.26E-04
SJCOG	2046	SBUS	Aggregate	Aggregate	Electricity	0	0	0	0.03%	6,764.25	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	SBUS	Aggregate	Aggregate	Natural Gas	1073.903131	2.312953689	0.218922178	0.01%	1,452.64	1.56E+00	3.36E-03	3.18E-04
SJCOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	1014.044438	0.000246575	0.159763114	0.00%	394.35	4.00E-01	9.72E-08	6.30E-05
SJCOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Electricity	0	0	0	0.00%	570.01	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	1014.352623	0.00024695	0.159811669	0.00%	541.74	5.50E-01	1.34E-07	8.66E-05
SJCOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Electricity	0	0	0	0.00%	781.19	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	1013.22302	0.000246119	0.159633699	0.01%	1,410.17	1.43E+00	3.47E-07	2.25E-04
SJCOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Electricity	0	0	0	0.01%	2,046.68	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	895.3727102	0.00026566	0.141066335	0.07%	16,434.88	1.47E+01	4.37E-06	2.32E-03
SJCOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Electricity	0	0	0	0.02%	5,248.24	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	1044.095106	0.000279833	0.164497609	0.02%	5,458.90	5.70E+00	1.53E-06	8.98E-04
SJCOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Electricity	0	0	0	0.03%	6,194.26	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	1045.105798	0.000278547	0.164656844	0.02%	3,554.48	3.71E+00	9.90E-07	5.85E-04
SJCOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Electricity	0	0	0	0.02%	4,025.33	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	1044.464168	0.000280545	0.164555755	0.07%	15,422.35	1.61E+01	4.33E-06	2.54E-03
SJCOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Electricity	0	0	0	0.08%	17,472.50	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	1071.693652	0.000361304	0.168845771	0.03%	5,893.69	6.32E+00	2.13E-06	9.95E-04
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Electricity	0	0	0	0.02%	3,781.72	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	1059.255678	0.873011689	0.215936199	0.00%	205.72	2.18E-01	1.80E-04	4.44E-05
SJCOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	1011.621348	0.000252467	0.159381355	0.05%	11,793.30	1.19E+01	2.98E-06	1.88E-03
SJCOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Electricity	0	0	0	0.06%	14,105.53	0.00E+00	0.00E+00	0.00E+00

SCENARIO	SICOG 2046 RTP/SCS No Build - STREX and IDLEX

Source	EMFAC2021 (v1.0.2) Emission Rates
Region Type	MPO
Region	SICOG
Calendar Year	2046
Season	Annual
Vehicle Classification	EMFAC202X Categories
Emissions Rate and Vehicle Activity Units	Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip

Daily Trips	3,063,084
Daily Vehicles	588,960

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	CO_2 IDLEX	CO_2 STREX	CH_4 IDLEX	CH_4 STREX	N_2O IDLEX	N_2O STREX	Fleet Mix (by Vehicle Trips)	Vehicle Trips per Day	Fleet Mix (by Vehicle Population)	Vehicles per Day	CO_2 STREX Emissions (MT/day)	CO_2 IDLEX Emissions (MT/day)	CH_4 STREX Emissions (MT/day)	CH_4 IDLEX Emissions (MT/day)	N_2O STREX Emissions (MT/day)	N_2O IDLEX Emissions (MT/day)
SICOG	2046	All Other Buses	Aggregate	Aggregate	Diesel	542.1735073	0	0.002465424	0	0.085419657	0	0.02%	689.96	0.01%	77.50	0.00E+00	4.20E-02	0.00E+00	1.91E-07	0.00E+00	6.62E-06
SICOG	2046	All Other Buses	Aggregate	Aggregate	Natural Gas	1164.098467	0	3.418630584	0	0.237309088	0	0.00%	53.87	0.00%	6.05	0.00E+00	7.04E-03	0.00E+00	2.07E-05	0.00E+00	1.44E-06
SICOG	2046	LDA	Aggregate	Aggregate	Gasoline	0	53.64868814	0	0.032118364	0	0.025846728	36.86%	1,129,110.96	41.52%	244,509.97	6.06E+01	0.00E+00	3.63E-02	0.00E+00	2.92E-02	0.00E+00
SICOG	2046	LDA	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.02%	701.73	0.03%	157.71	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	LDA	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	5.08%	155,557.53	5.66%	33,309.83	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	LDA	Aggregate	Aggregate	Plug-in Hybrid	0	55.58388033	0	0.04001405	0	0.018863459	1.55%	47,520.60	1.95%	11,488.13	2.64E+00	0.00E+00	1.90E-03	0.00E+00	8.96E-04	0.00E+00
SICOG	2046	LDT1	Aggregate	Aggregate	Gasoline	0	62.57996998	0	0.034290615	0	0.027150962	2.33%	71,358.67	2.69%	15,830.58	4.47E+00	0.00E+00	2.45E-03	0.00E+00	1.94E-03	0.00E+00
SICOG	2046	LDT1	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.00%	0.82	0.00%	0.18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	LDT1	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.07%	2,141.81	0.08%	457.14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	LDT1	Aggregate	Aggregate	Plug-in Hybrid	0	63.58225659	0	0.040009783	0	0.018857271	0.05%	1,452.72	0.06%	351.19	9.24E-02	0.00E+00	5.81E-05	0.00E+00	2.74E-05	0.00E+00
SICOG	2046	LDT2	Aggregate	Aggregate	Gasoline	0	65.78896704	0	0.041285813	0	0.030714052	20.04%	613,955.94	22.72%	133,802.31	4.04E+01	0.00E+00	2.53E-02	0.00E+00	1.89E-02	0.00E+00
SICOG	2046	LDT2	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.08%	2,329.23	0.09%	504.89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	LDT2	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.80%	24,463.58	0.89%	5,224.22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	LDT2	Aggregate	Aggregate	Plug-in Hybrid	0	66.86008497	0	0.039916473	0	0.018770668	0.49%	14,882.92	0.61%	3,597.95	9.95E-01	0.00E+00	5.94E-04	0.00E+00	2.79E-04	0.00E+00
SICOG	2046	LHD1	Aggregate	Aggregate	Gasoline	107.5255318	23.63340716	0.083276907	0.019575603	0.002421507	0.038709334	2.46%	75,199.54	0.86%	5,045.63	1.78E+00	5.43E-01	1.47E-03	4.20E-04	2.91E-03	1.22E-05
SICOG	2046	LHD1	Aggregate	Aggregate	Diesel	117.875715	0	0.005098128	0	0.018571367	0	1.36%	41,679.79	0.56%	3,312.31	0.00E+00	3.90E-01	0.00E+00	1.69E-05	0.00E+00	6.15E-05
SICOG	2046	LHD1	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	2.43%	74,448.84	0.90%	5,288.83	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	LHD2	Aggregate	Aggregate	Gasoline	123.9701391	23.28241304	0.073989608	0.017275996	0.002161247	0.034505216	0.26%	7,912.04	0.09%	530.87	1.84E-01	6.58E-02	1.37E-04	3.93E-05	2.73E-04	1.15E-06
SICOG	2046	LHD2	Aggregate	Aggregate	Diesel	192.8692032	0	0.005098128	0	0.030386622	0	0.68%	20,742.15	0.28%	1,648.39	0.00E+00	3.18E-01	0.00E+00	8.40E-06	0.00E+00	5.01E-05
SICOG	2046	LHD2	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.53%	16,296.11	0.21%	1,230.96	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	MCY	Aggregate	Aggregate	Gasoline	0	37.21074006	0	0.13048703	0	0.004518799	0.67%	20,599.79	1.75%	10,296.17	7.67E-01	0.00E+00	2.69E-03	0.00E+00	9.31E-05	0.00E+00
SICOG	2046	MDV	Aggregate	Aggregate	Gasoline	0	80.63870493	0	0.043929627	0	0.03179331	11.79%	361,220.59	13.53%	79,708.91	2.91E+01	0.00E+00	1.59E-02	0.00E+00	1.15E-02	0.00E+00
SICOG	2046	MDV	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.13%	4,010.90	0.15%	891.66	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	MDV	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.74%	22,589.33	0.82%	4,843.91	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	MDV	Aggregate	Aggregate	Plug-in Hybrid	0	81.42192473	0	0.039601455	0	0.01847911	0.31%	9,518.88	0.39%	2,301.19	7.75E-01	0.00E+00	3.77E-04	0.00E+00	1.76E-04	0.00E+00
SICOG	2046	MH	Aggregate	Aggregate	Gasoline	0	29.99876819	0	0.032376895	0	0.044540242	0.00%	59.54	0.10%	594.98	1.79E-03	0.00E+00	1.93E-06	0.00E+00	2.65E-06	0.00E+00
SICOG	2046	MH	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.00%	39.56	0.07%	395.44	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	Motor Coach	Aggregate	Aggregate	Diesel	8334.136335	0	0.185553219	0	1.313046574	0	0.01%	436.21	0.00%	18.98	0.00E+00	1.58E-01	0.00E+00	3.52E-06	0.00E+00	2.49E-05
SICOG	2046	OBUS	Aggregate	Aggregate	Gasoline	348.1765503	27.99034512	0.191201835	0.031219987	0.003822927	0.025333207	0.04%	1,364.96	0.01%	68.20	3.82E-02	2.37E-02	4.26E-05	1.30E-05	3.46E-05	2.61E-07
SICOG	2046	OBUS	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.03%	839.59	0.01%	41.95	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	PTO	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.00%	-	0.00%	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	PTO	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.00%	-	0.00%	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	SBUS	Aggregate	Aggregate	Gasoline	2418.960372	51.75760849	2.520359109	0.07003516	0.074526685	0.083497417	0.01%	337.52	0.01%	84.35	1.75E-02	2.04E-01	2.36E-05	2.13E-04	2.82E-05	6.29E-06
SICOG	2046	SBUS	Aggregate	Aggregate	Diesel	1852.134074	0	0.007765252	0	0.291804478	0	0.10%	3,067.38	0.04%	211.76	0.00E+00	3.92E-01	0.00E+00	1.64E-06	0.00E+00	6.18E-05
SICOG	2046	SBUS	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.11%	3,221.89	0.04%	241.22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	SBUS	Aggregate	Aggregate	Natural Gas	4312.463409	0	12.03381943	0	0.879123877	0	0.03%	1,022.15	0.01%	70.56	0.00E+00	3.04E-01	0.00E+00	8.49E-04	0.00E+00	6.20E-05
SICOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	512.8588831	0	0.002291385	0	0.080801126	0	0.00%	126.03	0.00%	5.48	0.00E+00	2.81E-03	0.00E+00	1.26E-08	0.00E+00	4.43E-07
SICOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.01%	172.04	0.00%	7.48	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	513.1773188	0	0.002291414	0	0.080851296	0	0.01%	154.90	0.00%	6.74	0.00E+00	3.46E-03	0.00E+00	1.54E-08	0.00E+00	5.45E-07
SICOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.01%	210.77	0.00%	9.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	512.2101537	0	0.002291356	0	0.080698918	0	0.02%	703.12	0.01%	30.59	0.00E+00	1.57E-02	0.00E+00	7.01E-08	0.00E+00	2.47E-06
SICOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.03%	966.01	0.01%	42.02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	501.4463906	0	0.002291359	0	0.079003083	0	0.06%	1,866.85	0.01%	81.21	0.00E+00	4.07E-02	0.00E+00	1.86E-07	0.00E+00	6.42E-06
SICOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.02%	574.27	0.00%	24.98	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	1753.740487	0	0.007729557	0	0.276302528	0	0.08%	2,362.30	0.03%	165.48	0.00E+00	2.90E-01	0.00E+00	1.28E-06	0.00E+00	4.57E-05
SICOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.08%	2,506.74	0.03%	175.60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	1754.176942	0	0.007729104	0	0.276371292	0	0.05%	1,538.25	0.02%	107.76	0.00E+00	1.89E-01	0.00E+00	8.33E-07	0.00E+00	2.98E-05
SICOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.05%	1,627.79	0.02%	114.03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	1753.908982	0	0.0077297	0	0.276329074	0	0.22%	6,674.61	0.08%	467.57	0.00E+00	8.20E-01	0.00E+00	3.61E-06	0.00E+00	1.29E-04
SICOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.23%	7,068.69	0.08%	495.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	1831.983874	0	0.007738633	0	0.288629805	0	0.05%	1,659.63	0.02%	116.26	0.00E+00	2.13E-01	0.00E+00	9.00E-07	0.00E+00	3.36E-05
SICOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.03%	1,003.99	0.01%	70.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SICOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	4513.688465	0	11.39590967	0	0.920144921	0	0.00%	59.40	0.00%	4.16	0.00E+00	1.88E-02	0.00E+00	4.74E-05	0.00E+00	3.83E-06
SICOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	1886.155045	0	0.008309927	0	0.297164495	0	0.11%	3,517.53	0.05%	304.17	0.00E+00	5.74E-01	0.00E+00	2.53E-06	0.00E+00	9.04E-05
SICOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.12%	3,722.40	0.05%	321.89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

SCENARIO	SJCOG 2046 RTP/SCS Scenario B - RUNEX

Source	EMFAC2021 (v1.0.2) Emission Rates
Region Type	MPO
Region	SJCOG
Calendar Year	2046
Season	Annual
Vehicle Classification	EMFAC202X Categories
Emissions Rate and Vehicle Activity Units	Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip

Daily VMT	23,397,883

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	CO_2 RUNEX	CH_4 RUNEX	N_2O RUNEX	Fleet Mix	VMT per Day	CO_2 RUNEX Emissions (tons/day)	CH_4 RUNEX Emissions (tons/day)	N_2O RUNEX Emissions (tons/day)
SJCOG	2046	All Other Buses	Aggregate	Aggregate	Diesel	1038.084573	0.00203365	0.163550647	0.01%	3,478.15	3.61E+00	7.07E-06	5.69E-04
SJCOG	2046	All Other Buses	Aggregate	Aggregate	Natural Gas	909.8882056	0.857361068	0.185486663	0.00%	255.96	2.33E-01	2.19E-04	4.75E-05
SJCOG	2046	LDA	Aggregate	Aggregate	Gasoline	228.8750323	0.00111171	0.003308407	41.45%	9,697,762.23	2.22E+03	1.08E-02	3.21E-02
SJCOG	2046	LDA	Aggregate	Aggregate	Diesel	182.6673843	0.000288849	0.028779321	0.02%	5,653.00	1.03E+00	1.63E-06	1.63E-04
SJCOG	2046	LDA	Aggregate	Aggregate	Electricity	0	0	0	5.40%	1,263,510.37	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDA	Aggregate	Aggregate	Plug-in Hybrid	124.5669062	0.000425133	0.000495386	1.96%	457,737.34	5.70E+01	1.95E-04	2.27E-04
SJCOG	2046	LDT1	Aggregate	Aggregate	Gasoline	264.2279019	0.001182371	0.00341225	2.45%	574,250.71	1.52E+02	6.79E-04	1.96E-03
SJCOG	2046	LDT1	Aggregate	Aggregate	Diesel	341.0539736	0.000834156	0.053733192	0.00%	6.80	2.32E-03	5.67E-09	3.65E-07
SJCOG	2046	LDT1	Aggregate	Aggregate	Electricity	0	0	0	0.07%	17,487.39	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT1	Aggregate	Aggregate	Plug-in Hybrid	124.2263028	0.000423097	0.00049202	0.06%	13,898.52	1.73E+00	5.88E-06	6.84E-06
SJCOG	2046	LDT2	Aggregate	Aggregate	Gasoline	274.160281	0.001469529	0.003518728	21.70%	5,077,540.35	1.39E+03	7.46E-03	1.79E-02
SJCOG	2046	LDT2	Aggregate	Aggregate	Diesel	252.483571	0.000832457	0.039778889	0.08%	19,369.28	4.89E+00	1.61E-05	7.70E-04
SJCOG	2046	LDT2	Aggregate	Aggregate	Electricity	0	0	0	0.59%	138,102.67	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT2	Aggregate	Aggregate	Plug-in Hybrid	124.4394915	0.000422941	0.000490847	0.60%	139,601.53	1.74E+01	5.90E-05	6.85E-05
SJCOG	2046	LHD1	Aggregate	Aggregate	Gasoline	747.8832461	0.001198497	0.001673491	0.73%	170,245.29	1.27E+02	2.04E-04	2.85E-04
SJCOG	2046	LHD1	Aggregate	Aggregate	Diesel	603.0568573	0.004338534	0.095011853	0.45%	105,505.39	6.36E+01	4.58E-04	1.00E-02
SJCOG	2046	LHD1	Aggregate	Aggregate	Electricity	0	0	0	0.95%	223,196.25	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LHD2	Aggregate	Aggregate	Gasoline	842.6036056	0.001098063	0.002139618	0.08%	17,641.77	1.49E+01	1.94E-05	3.77E-05
SJCOG	2046	LHD2	Aggregate	Aggregate	Diesel	706.2186156	0.005464223	0.11126503	0.21%	50,089.53	3.54E+01	2.74E-04	5.57E-03
SJCOG	2046	LHD2	Aggregate	Aggregate	Electricity	0	0	0	0.22%	50,741.74	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	MCY	Aggregate	Aggregate	Gasoline	188.5213727	0.144517645	0.035878114	0.23%	54,272.13	1.02E+01	7.84E-03	1.95E-03
SJCOG	2046	MDV	Aggregate	Aggregate	Gasoline	332.6583179	0.001551813	0.003643339	12.00%	2,806,911.08	9.34E+02	4.36E-03	1.02E-02
SJCOG	2046	MDV	Aggregate	Aggregate	Diesel	329.5542307	0.000308478	0.051921403	0.13%	30,737.89	1.01E+01	9.48E-06	1.60E-03
SJCOG	2046	MDV	Aggregate	Aggregate	Electricity	0	0	0	0.54%	126,565.89	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	MDV	Aggregate	Aggregate	Plug-in Hybrid	124.496848	0.000420413	0.000484887	0.36%	84,200.46	1.05E+01	3.54E-05	4.08E-05
SJCOG	2046	MH	Aggregate	Aggregate	Gasoline	1947.468291	0.004058195	0.018831984	0.03%	6,187.74	1.21E+01	2.51E-05	1.17E-04
SJCOG	2046	MH	Aggregate	Aggregate	Diesel	1089.291744	0.004053637	0.171618358	0.02%	3,552.55	3.87E+00	1.44E-05	6.10E-04
SJCOG	2046	Motor Coach	Aggregate	Aggregate	Diesel	1528.724378	0.00048903	0.240851148	0.01%	2,427.26	3.71E+00	1.19E-06	5.85E-04
SJCOG	2046	OBUS	Aggregate	Aggregate	Gasoline	1535.331791	0.004872022	0.017364528	0.01%	2,422.34	3.72E+00	1.18E-05	4.21E-05
SJCOG	2046	OBUS	Aggregate	Aggregate	Electricity	0	0	0	0.01%	2,898.37	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	PTO	Aggregate	Aggregate	Diesel	1734.607319	0.000656568	0.273288089	0.05%	12,867.12	2.23E+01	8.45E-06	3.52E-03
SJCOG	2046	PTO	Aggregate	Aggregate	Electricity	0	0	0	0.05%	12,809.93	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	SBUS	Aggregate	Aggregate	Gasoline	751.4890514	0.001926092	0.014653605	0.02%	4,514.32	3.39E+00	8.69E-06	6.62E-05
SJCOG	2046	SBUS	Aggregate	Aggregate	Diesel	1032.901741	0.000336099	0.16273409	0.02%	4,495.69	4.64E+00	1.51E-06	7.32E-04
SJCOG	2046	SBUS	Aggregate	Aggregate	Electricity	0	0	0	0.03%	6,815.85	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	SBUS	Aggregate	Aggregate	Natural Gas	1073.903131	2.312953689	0.218922178	0.01%	1,463.72	1.57E+00	3.39E-03	3.20E-04
SJCOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	1014.044438	0.000246575	0.159763114	0.00%	397.35	4.03E-01	9.80E-08	6.35E-05
SJCOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Electricity	0	0	0	0.00%	574.36	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	1014.352623	0.00024695	0.159811669	0.00%	545.87	5.54E-01	1.35E-07	8.72E-05
SJCOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Electricity	0	0	0	0.00%	787.15	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	1013.22302	0.000246119	0.159633699	0.01%	1,420.92	1.44E+00	3.50E-07	2.27E-04
SJCOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Electricity	0	0	0	0.01%	2,062.30	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	895.3727102	0.00026566	0.141066335	0.07%	16,560.24	1.48E+01	4.40E-06	2.34E-03
SJCOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Electricity	0	0	0	0.02%	5,288.27	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	1044.095106	0.000279833	0.164497609	0.02%	5,500.54	5.74E+00	1.54E-06	9.05E-04
SJCOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Electricity	0	0	0	0.03%	6,241.51	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	1045.105798	0.000278547	0.164656844	0.02%	3,581.60	3.74E+00	9.98E-07	5.90E-04
SJCOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Electricity	0	0	0	0.02%	4,056.03	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	1044.464168	0.000280545	0.164555755	0.07%	15,540.00	1.62E+01	4.36E-06	2.56E-03
SJCOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Electricity	0	0	0	0.08%	17,605.78	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	1071.693652	0.000361304	0.168845771	0.03%	5,938.64	6.36E+00	2.15E-06	1.00E-03
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Electricity	0	0	0	0.02%	3,810.57	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	1059.255678	0.873011689	0.215936199	0.00%	207.29	2.20E-01	1.81E-04	4.48E-05
SJCOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	1011.621348	0.000252467	0.159381355	0.05%	11,883.26	1.20E+01	3.00E-06	1.89E-03
SJCOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Electricity	0	0	0	0.06%	14,213.13	0.00E+00	0.00E+00	0.00E+00

SCENARIO	SJCOG 2046 RTP/SCS Scenario B - STREX and IDLEX

Source	EMFAC2021 (v1.0.2) Emission Rates
Region Type	MPO
Region	SJCOG
Calendar Year	2046
Season	Annual
Vehicle Classification	EMFAC202X Categories
Emissions Rate and Vehicle Activity Units	Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for

Daily Trips	3,086,045
Daily Vehicles	593,453

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	CO_2 IDLEX	CO_2 STREX	CH_4 IDLEX	CH_4 STREX	N_2O IDLEX	N_2O STREX	Fleet Mix (by Vehicle Trips)	Vehicle Trips per Day	Fleet Mix (by Vehicle Population)	Vehicles per Day	CO_2 STREX Emissions (MT/day)	CO_2 IDLEX Emissions (MT/day)	CH_4 STREX Emissions (MT/day)	CH_4 IDLEX Emissions (MT/day)	N_2O STREX Emissions (MT/day)	N_2O IDLEX Emissions (MT/day)
SJCOG	2046	All Other Buses	Aggregate	Aggregate	Diesel	542.1735073	0	0.002465424	0	0.085419657	0	0.02%	695.14	0.01%	78.09	0.00E+00	4.23E-02	0.00E+00	1.93E-07	0.00E+00	6.67E-06
SJCOG	2046	All Other Buses	Aggregate	Aggregate	Natural Gas	1164.098467	0	3.418630584	0	0.237309088	0	0.00%	54.28	0.00%	6.10	0.00E+00	7.10E-03	0.00E+00	2.08E-05	0.00E+00	1.45E-06
SJCOG	2046	LDA	Aggregate	Aggregate	Gasoline	0	53.64868814	0	0.032118364	0	0.025846728	36.86%	1,137,574.67	41.52%	246,375.14	6.10E+01	0.00E+00	3.65E-02	0.00E+00	2.94E-02	0.00E+00
SJCOG	2046	LDA	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.02%	706.99	0.03%	158.91	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDA	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	5.08%	156,723.57	5.66%	33,563.92	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDA	Aggregate	Aggregate	Plug-in Hybrid	0	55.58388033	0	0.04001405	0	0.018863459	1.55%	47,876.81	1.95%	11,575.76	2.66E+00	0.00E+00	1.92E-03	0.00E+00	9.03E-04	0.00E+00
SJCOG	2046	LDT1	Aggregate	Aggregate	Gasoline	0	62.57996998	0	0.034290615	0	0.027150962	2.33%	71,893.57	2.69%	15,951.34	4.50E+00	0.00E+00	2.47E-03	0.00E+00	1.95E-03	0.00E+00
SJCOG	2046	LDT1	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.00%	0.83	0.00%	0.18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT1	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.07%	2,157.86	0.08%	460.62	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT1	Aggregate	Aggregate	Plug-in Hybrid	0	63.58225659	0	0.040009783	0	0.018857271	0.05%	1,463.60	0.06%	353.87	9.31E-02	0.00E+00	5.86E-05	0.00E+00	2.76E-05	0.00E+00
SJCOG	2046	LDT2	Aggregate	Aggregate	Gasoline	0	65.78896704	0	0.041285813	0	0.030714052	20.04%	618,558.10	22.72%	134,822.98	4.07E+01	0.00E+00	2.55E-02	0.00E+00	1.90E-02	0.00E+00
SJCOG	2046	LDT2	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.08%	2,346.69	0.09%	508.74	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT2	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.80%	24,646.95	0.89%	5,264.08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LDT2	Aggregate	Aggregate	Plug-in Hybrid	0	66.86008497	0	0.039916473	0	0.018770668	0.49%	14,994.48	0.61%	3,625.40	1.00E+00	0.00E+00	5.99E-04	0.00E+00	2.81E-04	0.00E+00
SJCOG	2046	LHD1	Aggregate	Aggregate	Gasoline	107.5255318	23.63340716	0.083276907	0.019575603	0.002421507	0.038709334	2.46%	75,763.23	0.86%	5,084.12	1.79E+00	5.47E-01	1.48E-03	4.23E-04	2.93E-03	1.23E-05
SJCOG	2046	LHD1	Aggregate	Aggregate	Diesel	117.875715	0	0.005098128	0	0.018571367	0	1.36%	41,992.22	0.56%	3,337.58	0.00E+00	3.93E-01	0.00E+00	1.70E-05	0.00E+00	6.20E-05
SJCOG	2046	LHD1	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	2.43%	75,006.90	0.90%	5,329.18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	LHD2	Aggregate	Aggregate	Gasoline	123.9701391	23.28241304	0.073989608	0.017275996	0.002161247	0.034505216	0.26%	7,971.35	0.09%	534.92	1.86E-01	6.63E-02	1.38E-04	3.96E-05	2.75E-04	1.16E-06
SJCOG	2046	LHD2	Aggregate	Aggregate	Diesel	192.8692032	0	0.005098128	0	0.030386622	0	0.68%	20,897.64	0.28%	1,660.96	0.00E+00	3.20E-01	0.00E+00	8.47E-06	0.00E+00	5.05E-05
SJCOG	2046	LHD2	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.53%	16,418.26	0.21%	1,240.35	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	MCY	Aggregate	Aggregate	Gasoline	0	37.21074006	0	0.13048703	0	0.004518799	0.67%	20,754.20	1.75%	10,374.71	7.72E-01	0.00E+00	2.71E-03	0.00E+00	9.38E-05	0.00E+00
SJCOG	2046	MDV	Aggregate	Aggregate	Gasoline	0	80.63870493	0	0.043929627	0	0.03179331	11.79%	363,928.26	13.53%	80,316.94	2.93E+01	0.00E+00	1.60E-02	0.00E+00	1.16E-02	0.00E+00
SJCOG	2046	MDV	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.13%	4,040.96	0.15%	898.46	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	MDV	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.74%	22,758.66	0.82%	4,880.86	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	MDV	Aggregate	Aggregate	Plug-in Hybrid	0	81.42192473	0	0.039601455	0	0.01847911	0.31%	9,590.23	0.39%	2,318.75	7.81E-01	0.00E+00	3.80E-04	0.00E+00	1.77E-04	0.00E+00
SJCOG	2046	MH	Aggregate	Aggregate	Gasoline	0	29.99876819	0	0.032376895	0	0.044540242	0.00%	59.99	0.10%	599.52	1.80E-03	0.00E+00	1.94E-06	0.00E+00	2.67E-06	0.00E+00
SJCOG	2046	MH	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.00%	39.86	0.07%	398.46	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	Motor Coach	Aggregate	Aggregate	Diesel	8334.136335	0	0.185553219	0	1.313046574	0	0.01%	439.48	0.00%	19.12	0.00E+00	1.59E-01	0.00E+00	3.55E-06	0.00E+00	2.51E-05
SJCOG	2046	OBUS	Aggregate	Aggregate	Gasoline	348.1765503	27.99034512	0.191201835	0.031219987	0.003822927	0.025333207	0.04%	1,375.20	0.01%	68.72	3.85E-02	2.39E-02	4.29E-05	1.31E-05	3.48E-05	2.63E-07
SJCOG	2046	OBUS	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.03%	845.89	0.01%	42.27	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	PTO	Aggregate	Aggregate	Diesel	0	0	0	0	0	0	0.00%	-	0.00%	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	PTO	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.00%	-	0.00%	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	SBUS	Aggregate	Aggregate	Gasoline	2418.960372	51.75760849	2.520359109	0.07003516	0.074526685	0.083497417	0.01%	340.05	0.01%	84.99	1.76E-02	2.06E-01	2.38E-05	2.14E-04	2.84E-05	6.33E-06
SJCOG	2046	SBUS	Aggregate	Aggregate	Diesel	1852.134074	0	0.007765252	0	0.291804478	0	0.10%	3,090.37	0.04%	213.37	0.00E+00	3.95E-01	0.00E+00	1.66E-06	0.00E+00	6.23E-05
SJCOG	2046	SBUS	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.11%	3,246.04	0.04%	243.06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	SBUS	Aggregate	Aggregate	Natural Gas	4312.463409	0	12.03381943	0	0.879123877	0	0.03%	1,029.81	0.01%	71.10	0.00E+00	3.07E-01	0.00E+00	8.56E-04	0.00E+00	6.25E-05
SJCOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	512.8588831	0	0.002291385	0	0.080801126	0	0.00%	126.97	0.00%	5.52	0.00E+00	2.83E-03	0.00E+00	1.27E-08	0.00E+00	4.46E-07
SJCOG	2046	T6 CAIRP Class 4	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.01%	173.33	0.00%	7.54	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	513.1773188	0	0.002291414	0	0.080851296	0	0.01%	156.06	0.00%	6.79	0.00E+00	3.48E-03	0.00E+00	1.56E-08	0.00E+00	5.49E-07
SJCOG	2046	T6 CAIRP Class 5	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.01%	212.35	0.00%	9.24	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	512.2101537	0	0.002291356	0	0.080698918	0	0.02%	708.39	0.01%	30.82	0.00E+00	1.58E-02	0.00E+00	7.06E-08	0.00E+00	2.49E-06
SJCOG	2046	T6 CAIRP Class 6	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.03%	973.25	0.01%	42.34	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	501.4463906	0	0.002291359	0	0.079003083	0	0.06%	1,880.85	0.01%	81.83	0.00E+00	4.10E-02	0.00E+00	1.87E-07	0.00E+00	6.46E-06
SJCOG	2046	T6 CAIRP Class 7	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.02%	578.57	0.00%	25.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	1753.740487	0	0.007729557	0	0.276302528	0	0.08%	2,380.00	0.03%	166.75	0.00E+00	2.92E-01	0.00E+00	1.29E-06	0.00E+00	4.61E-05
SJCOG	2046	T6 Instate Delivery Class 4	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.08%	2,525.53	0.03%	176.94	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	1754.176942	0	0.007729104	0	0.276371292	0	0.05%	1,549.78	0.02%	108.58	0.00E+00	1.90E-01	0.00E+00	8.39E-07	0.00E+00	3.00E-05
SJCOG	2046	T6 Instate Delivery Class 5	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.05%	1,639.99	0.02%	114.90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	1753.908982	0	0.0077297	0	0.276329074	0	0.22%	6,724.64	0.08%	471.13	0.00E+00	8.26E-01	0.00E+00	3.64E-06	0.00E+00	1.30E-04
SJCOG	2046	T6 Instate Delivery Class 6	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.23%	7,121.68	0.08%	498.95	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	1831.983874	0	0.007738633	0	0.288629805	0	0.05%	1,672.07	0.02%	117.15	0.00E+00	2.15E-01	0.00E+00	9.07E-07	0.00E+00	3.38E-05
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.03%	1,011.52	0.01%	70.87	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SJCOG	2046	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	4513.688465	0	11.39590967	0	0.920144921	0	0.00%	59.85	0.00%	4.19	0.00E+00	1.89E-02	0.00E+00	4.78E-05	0.00E+00	3.86E-06
SJCOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	1886.155045	0	0.008309927	0	0.297164495	0	0.11%	3,543.90	0.05%	306.49	0.00E+00	5.78E-01	0.00E+00	2.55E-06	0.00E+00	9.11E-05
SJCOG	2046	T6 Instate Other Class 4	Aggregate	Aggregate	Electricity	0	0	0	0	0	0	0.12%	3,750.30	0.05%	324.35	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

San Joaquin

San Joaquin Offmodel Strategy GHG Reduction Summary

	2005 (baseline)	2020	2035	
2022 RTP/SCS Scenario				
CO2 Emissions	**6036.25**	**6447.53**	**7362.05**	*Enter daily LDV CO2 emissions in tons from SB375 Post-Processing File (scenario run using travel model VMT and speed distribution), Rows 18-20 of the "mpo data*
Population	**652339**	**773581**	**917811**	*Enter Total Vehicle Population*

Measure/Strategy		2020 GHG Reduction (tons)	2035 GHG Reduction (tons)	Reference	
Transit Improvement		0.00	0.00	*CARB SB375 Guidelines, November 2019*	
Bike & Pedestrian		0.00	0.00	*CARB SB375 Guidelines, November 2019*	
Bike Share		0.00	0.00	*CARB SB375 Guidelines, November 2019*	
Telecommuting		0.00	0.00	*CARB SB375 Guidelines, November 2019*	*Note: cannot take credit for Telecommuting, Rule 9410 and Vanpool toge*
Rule 9410		0.00	155.87	*SJVAPCD Rule9410; http://www.valleyair.org/Programs/Rule9410TripReduction/eTRIP_main.htm*	*Note: cannot take credit for Telecommuting, Rule 9410 and Vanpool toge*
Car Sharing		0.00	0.00	*CARB SB375 Guidelines, November 2019*	
Parking Management		0.00E+00	0.00E+00	*CARB SB375 Guidelines, November 2019*	
Electric Vehicle Incentive		0.00E+00	0.00E+00	*CARB SB375 Guidelines, November 2019*	
Electric Vehicle Charging	Method a	0.00	19.86	*CARB SB375 Guidelines, November 2019*	
TSM-ITS		0.00	0.00	*CARB SB375 Guidelines, November 2019*	
Vanpools/Calvans		0.00	36.70	*CARB SB375 Guidelines or Calvans data*	*Note: Use CARB methodology or Calvans data directly; make sure to ave*
Total CO2 Emissions Reduction from Offmodel		0.00	212.43		
Total CO2 Emissions per Weekday		6,447.53	7,149.61		
EMFAC Adjustment		0.4%	0.6%	*EMFAC Adjustment Methodology, Appendix D of the SCS Program and Evaluation Guidelines, 2019*	*Note: Enter % adjustment from Row 20 of the CO2_Adj tab of the SB375*
% Total Reduction in CO2 Emissions Per Capita		-10.3%	-16.4%		

Notes:
1. When the SCS Quantification Methodology is submitted for CARB review, MPOs will need to provide supplemental information on their off-model strategies (e.g. policy-related documentation, funding sources, implementation timeline, project status, etc.)
2. If an MPO applies more than one strategy that share the same inputs, MPO staff should ensure those variables are consistent across strategies (e.g. “average regional HW trip lengths” variable in "Bike & Pedestriation" and "Bike Share" programs).
3. MPOs should include specific data sources in Column G for each strategy with references, as appropriate.
4. If using actual data for 2020 (e.g. HPMS, traffic counts, PeMS, etc), the impacts from offmodel strategies is likley already captured. In this case, offmodel strategy analysis for CY 2020 is not necessary (enter zeroes for all inputs).

San Joaquin

San Joaquin Offmodel Strategy GHG Reduction Summary

	2005 (baseline)	2020	2046	
2022 RTP/SCS Scenario				
CO2 Emissions	**6036.25**	**6447.53**	**7969.00**	*Enter daily LDV CO2 emissions in tons from SB375 Post-Processing File (scenario run using travel model VMT and speed distribution), Rows 18-20 of the "mpo data*
Population	**652339**	**773581**	**994257**	*Enter Total Vehicle Population*

Measure/Strategy		2020 GHG Reduction (tons)	2046 GHG Reduction (tons)	Reference	
Transit Improvement		0.00	0.00	*CARB SB375 Guidelines, November 2019*	
Bike & Pedestrian		0.00	0.00	*CARB SB375 Guidelines, November 2019*	
Bike Share		0.00	0.00	*CARB SB375 Guidelines, November 2019*	
Telecommuting		0.00	0.00	*CARB SB375 Guidelines, November 2019*	*Note: cannot take credit for Telecommuting, Rule 9410 and Vanpool toge*
Rule 9410		0.00	185.79	*SJVAPCD Rule9410; http://www.valleyair.org/Programs/Rule9410TripReduction/eTRIP_main.htm*	*Note: cannot take credit for Telecommuting, Rule 9410 and Vanpool toge*
Car Sharing		0.00	0.00	*CARB SB375 Guidelines, November 2019*	
Parking Management		0.00E+00	0.00E+00	*CARB SB375 Guidelines, November 2019*	
Electric Vehicle Incentive		0.00E+00	0.00E+00	*CARB SB375 Guidelines, November 2019*	
Electric Vehicle Charging	Method a	0.00	39.72	*CARB SB375 Guidelines, November 2019*	
TSM-ITS		0.00	0.00	*CARB SB375 Guidelines, November 2019*	
Vanpools/Calvans		0.00	39.30	*CARB SB375 Guidelines or Calvans data*	*Note: Use CARB methodology or Calvans data directly; make sure to ave*
Total CO2 Emissions Reduction from Offmodel		0.00	264.81		
Total CO2 Emissions per Weekday		6,447.53	7,704.19		
EMFAC Adjustment		0.4%	0.6%	*EMFAC Adjustment Methodology, Appendix D of the SCS Program and Evaluation Guidelines, 2019*	*Note: Enter % adjustment from Row 20 of the CO2_Adj tab of the SB375*
% Total Reduction in CO2 Emissions Per Capita		-10.3%	-16.8%		

Notes:
1. When the SCS Quantification Methodology is submitted for CARB review, MPOs will need to provide supplemental information on their off-model strategies (e.g. policy-related documentation, funding sources, implementation timeline, project status, etc.)
2. If an MPO applies more than one strategy that share the same inputs, MPO staff should ensure those variables are consistent across strategies (e.g. “average regional HW trip lengths” variable in "Bike & Pedestriation" and "Bike Share" programs).
3. MPOs should include specific data sources in Column G for each strategy with references, as appropriate.
4. If using actual data for 2020 (e.g. HPMS, traffic counts, PeMS, etc), the impacts from offmodel strategies is likley already captured. In this case, offmodel strategy analysis for CY 2020 is not necessary (enter zeroes for all inputs).

Appendix B

Special Status Species Tables

Scientific Name Common Name	Status	Habitat Requirements
Plants and Lichens		
Amsinckia grandiflora large-flowered fiddleneck	FE/SE G1/S1 1B.1	Cismontane woodland, Valley and foothill grassland. Annual grassland in various soils. 270-550m. Blooms (Mar)Apr-May.
Astragalus tener var. *tener* alkali milk-vetch	None/None G2T1/S1 1B.2	Playas, Valley and foothill grassland, Vernal pools. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 1-60m. Blooms Mar-Jun.
Atriplex cordulata var. *cordulata* heartscale	None/None G3T2/S2 1B.2	Chenopod scrub, Meadows and seeps, Valley and foothill grassland. Alkaline flats and scalds in the Central Valley, sandy soils. 0-560m. Blooms Apr-Oct.
Blepharizonia plumosa big tarplant	None/None G1G2/S1S2 1B.1	Valley and foothill grassland. Dry hills & plains in annual grassland. Clay to clay-loam soils; usually on slopes and often in burned areas. 30-505m. Blooms Jul-Oct.
Brasenia schreberi watershield	None/None G5/S3 2B.3	Marshes and swamps. Aquatic known from water bodies both natural and artificial in California. 0-2200m. Blooms Jun-Sep.
Calycadenia hooveri Hoover's calycadenia	None/None G2/S2 1B.3	Cismontane woodland, Valley and foothill grassland. On exposed, rocky, barren soil. 65-300m. Blooms Jul-Sep.
Carex comosa bristly sedge	None/None G5/S2 2B.1	Coastal prairie, Marshes and swamps, Valley and foothill grassland. Lake margins, wet places; site below sea level is on a Delta island. - 0-625m. Blooms May-Sep.
Castilleja campestris var. *succulenta* succulent owl's-clover	FT/SE G4?T2T3/S2S3 1B.2	Vernal pools. Moist places, often in acidic soils. 50-750m. Blooms (Mar)Apr-May.
Caulanthus lemmonii Lemmon's jewelflower	None/None G3/S3 1B.2	Pinyon and juniper woodland, Valley and foothill grassland. 80-1580m. Blooms Feb-May.
Chloropyron palmatum palmate-bracted bird's-beak	FE/SE G1/S1 1B.1	Chenopod scrub, Valley and foothill grassland. Usually on Pescadero silty clay which is alkaline, with Distichlis, Frankenia, etc. 5-155m. Blooms May-Oct.
Cirsium crassicaule slough thistle	None/None G1/S1 1B.1	Chenopod scrub, Marshes and swamps, Riparian scrub. Sloughs, riverbanks, and marshy areas. 3-100m. Blooms May-Aug.
Delphinium californicum ssp. *interius* Hospital Canyon larkspur	None/None G3T3/S3 1B.2	Chaparral, Cismontane woodland, Coastal scrub. In wet, boggy meadows, openings in chaparral and in canyons. 195-1095m. Blooms Apr-Jun.
Delphinium recurvatum recurved larkspur	None/None G2?/S2? 1B.2	Chenopod scrub, Cismontane woodland, Valley and foothill grassland. Alkaline 3-790m. Blooms Mar-Jun.
Downingia pusilla dwarf downingia	None/None GU/S2 2B.2	Valley and foothill grassland, Vernal pools. Vernal lake and pool margins with a variety of associates. In several types of vernal pools. 1-445m. Blooms Mar-May.

Eryngium pinnatisectum Tuolumne button-celery	None/None G2/S2 1B.2	Cismontane woodland, Lower montane coniferous forest, Vernal pools. Volcanic soils; vernal pools and mesic sites within other natural communities. 70-915m. Blooms May-Aug.
Eryngium racemosum Delta button-celery	None/SE G1/S1 1B.1	Riparian scrub. Seasonally inundated floodplain on clay. 3-30m. Blooms (May)Jun-Oct.
Eschscholzia rhombipetala diamond-petaled California poppy	None/None G1/S1 1B.1	Valley and foothill grassland. Alkaline, clay slopes and flats. 0-975m. Blooms Mar-Apr.
Extriplex joaquinana San Joaquin spearscale	None/None G2/S2 1B.2	Annual herb. Blooms April through October. Chenopod scrub, alkali meadow, playas, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with Distichlis spicata, Frankenia, etc. 1-835 m.
Gratiola heterosepala Boggs Lake hedge-hyssop	None/SE G2/S2 1B.2	Marshes and swamps, Vernal pools. Clay soils; usually in vernal pools, sometimes on lake margins. 10-2375m. Blooms Apr-Aug.
Hibiscus lasiocarpos var. *occidentalis* woolly rose-mallow	None/None G5T3/S3 1B.2	Marshes and swamps. Moist, freshwater-soaked river banks & low peat islands in sloughs; can also occur on riprap and levees. In California, known from the delta watershed. 0-120m. Blooms Jun-Sep.
Lathyrus jepsonii var. *jepsonii* Delta tule pea	None/None G5T2/S2 1B.2	Marshes and swamps. In freshwater and brackish marshes. Often found with Typha, Aster lentus, Rosa californica, Juncus spp., Scirpus, etc. Usually on marsh and slough edges. 0-5m. Blooms May-Jul(Aug-Sep).
Legenere limosa legenere	None/None G2/S2 1B.1	Vernal pools. In beds of vernal pools. 1-880m. Blooms Apr-Jun.
Lilaeopsis masonii Mason's lilaeopsis	None/SR G2/S2 1B.1	Marshes and swamps, Riparian scrub. Tidal zones, in muddy or silty soil formed through river deposition or river bank erosion. In brackish or freshwater. 0-10m. Blooms Apr-Nov.
Limosella australis Delta mudwort	None/None G4G5/S2 2B.1	Marshes and swamps, Riparian scrub. Usually on mud banks of the Delta in marshy or scrubby riparian associations; often with Lilaeopsis masonii. 0-3m. Blooms May-Aug.
Madia radiata showy golden madia	None/None G3/S3 1B.1	Cismontane woodland, Valley and foothill grassland. Mostly on adobe clay in grassland or among shrubs. 25-1215m. Blooms Mar-May.
Navarretia nigelliformis ssp. *radians* shining navarretia	None/None G4T2/S2 1B.2	Cismontane woodland, Valley and foothill grassland, Vernal pools. Apparently in grassland, and not necessarily in vernal pools. 65-1000m. Blooms (Mar)Apr-Jul.
Sagittaria sanfordii Sanford's arrowhead	None/None G3/S3 1B.2	Marshes and swamps. In standing or slow-moving freshwater ponds, marshes, and ditches. 0-650m. Blooms May-Oct(Nov).
Scutellaria galericulata marsh skullcap	None/None G5/S2 2B.2	Lower montane coniferous forest, Marshes and swamps, Meadows and seeps. Swamps and wet places. 0-2100m. Blooms Jun-Sep.

Scutellaria lateriflora side-flowering skullcap	None/None G5/S2 2B.2	Marshes and swamps, Meadows and seeps. Wet meadows and marshes. In the Delta, often found on logs. 0-500m. Blooms Jul-Sep.
Symphyotrichum lentum Suisun Marsh aster	None/None G2/S2 1B.2	Marshes and swamps. Most often seen along sloughs with Phragmites, Scirpus, blackberry, Typha, etc. 0-3m. Blooms (Apr)May-Nov.
Trichocoronis wrightii var. *wrightii* Wright's trichocoronis	None/None G4T3/S1 2B.1	Marshes and swamps, Meadows and seeps, Riparian forest, Vernal pools. Mud flats of vernal lakes, drying river beds, alkali meadows. 5-435m. Blooms May-Sep.
Trifolium hydrophilum saline clover	None/None G2/S2 1B.2	Marshes and swamps, Valley and foothill grassland, Vernal pools. Mesic, alkaline sites. 0-300m. Blooms Apr-Jun.
Tropidocarpum capparideum caper-fruited tropidocarpum	None/None G1/S1 1B.1	Valley and foothill grassland. Alkaline clay. 1-455m. Blooms Mar-Apr.
Tuctoria greenei Greene's tuctoria	FE/SR G1/S1 1B.1	Vernal pools. Vernal pools in open grasslands. 30-1070m. Blooms May-Jul(Sep).
Invertebrates		
Andrena blennospermatis Blennosperma vernal pool andrenid bee	None/None G2/S2	This bee is oligolectic on vernal pool blennosperma. Bees nest in the uplands around vernal pools.
Andrena subapasta An andrenid bee	None/None G1G2/S1S2	Collects pollen primarily from Arenaria californica but also Orthocarpus erianthus & Lasthenia spp.
Anthicus sacramento Sacramento anthicid beetle	None/None G1/S1	Restricted to sand dune areas. Inhabit sand slipfaces among bamboo and willow but may not depend on presence of these plant species.
Bombus crotchii Crotch bumble bee	None/SCE G3G4/S1S2	Coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum.
Bombus occidentalis western bumble bee	None/SCE G2G3/S1	Once common & widespread, species has declined precipitously from central CA to southern B.C., perhaps from disease.
Branchinecta lynchi vernal pool fairy shrimp	FT/None G3/S3	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.
Branchinecta mesovallensis midvalley fairy shrimp	None/None G2/S2S3	Vernal pools in the Central Valley.
Desmocerus californicus dimorphus valley elderberry longhorn beetle	FT/None G3T2/S3	Occurs only in the Central Valley of California, in association with blue elderberry (Sambucus mexicana). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.
Gonidea angulata western ridged mussel	None/None G3/S1S2	Primarily creeks & rivers & less often lakes. Originally in most of state, now extirpated from Central & Southern Calif.

Hydrochara rickseckeri Ricksecker's water scavenger beetle	None/None G2?/S2?	Aquatic beetle thought to be endemic to the San Francisco Bay area of California.
Lepidurus packardi vernal pool tadpole shrimp	FE/None G4/S3S4	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass-bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.
Linderiella occidentalis California linderiella	None/None G2G3/S2S3	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity, conductivity, and total dissolved solids.
Lytta moesta moestan blister beetle	None/None G2/S2	Central California. Often found on flowers, and historical distribution includes Kern, Tulare, Fresno, Madera, Santa Cruz, and Stanislaus Counties.
Fish		
Hypomesus transpacificus Delta smelt	FT/SE G1/S1	Sacramento-San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait & San Pablo Bay. Seldom found at salinities > 10 ppt. Most often at salinities < 2ppt.
Mylopharodon conocephalus hardhead	None/None G3/S3 SSC	Low to mid-elevation streams in the Sacramento-San Joaquin drainage. Also present in the Russian River. Clear, deep pools with sand-gravel-boulder bottoms and slow water velocity. Not found where exotic centrarchids predominate.
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	FT/None G5T2Q/S2	Populations in the Sacramento and San Joaquin rivers and their tributaries.
Pogonichthys macrolepidotus Sacramento splittail	None/None GNR/S3 SSC	Endemic to the lakes and rivers of the Central Valley, but now confined to the Delta, Suisun Bay and associated marshes. Slow moving river sections, dead end sloughs. Requires flooded vegetation for spawning and foraging for young.
Spirinchus thaleichthys longfin smelt	FC/ST G5/S1	Euryhaline, nektonic & anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater.
Amphibians		
Rana boylii foothill yellow-legged frog	None/SE G3/S3 SSC	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.
Rana draytonii California red-legged frog	FT/None G2G3/S2S3 SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval

		development. Must have access to estivation habitat.
Spea hammondii western spadefoot	None/None G2G3/S3 SSC	Occurs primarily in grassland habitats but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.
Reptiles		
Anniella pulchra Northern California legless lizard	None/None G3/S3 SSC	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. They prefer soils with a high moisture content.
Arizona elegans occidentalis California glossy snake	None/None G5T2/S2 SSC	Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular ranges, south to Baja California. Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.
Emys marmorata western pond turtle	None/None G3G4/S3 SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.
Masticophis flagellum ruddocki San Joaquin coachwhip	None/None G5T2T3/S2? SSC	Open, dry habitats with little or no tree cover. Found in valley grassland and saltbush scrub in the San Joaquin Valley. Needs mammal burrows for refuge and oviposition sites.
Masticophis lateralis euryxanthus Alameda whipsnake	FT/ST G4T2/S2	Typically found in chaparral and scrub habitats but will also use adjacent grassland, oak savanna and woodland habitats. Mostly south-facing slopes and ravines, with rock outcrops, deep crevices or abundant rodent burrows, where shrubs form a vegetative mosaic with oak trees and grasses.
Phrynosoma blainvillii coast horned lizard	None/None G3G4/S3S4 SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.
Thamnophis gigas giant gartersnake	FT/ST G2/S2	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the gartersnakes in California.
Birds		
Agelaius tricolor tricolored blackbird	None/ST G1G2/S1S2 SSC	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.
Aquila chrysaetos golden eagle	None/None G5/S3 FP WL	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.

Ardea herodias great blue heron	None/None G5/S4	Colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.
Athene cunicularia burrowing owl	None/None G4/S3 SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.
Buteo regalis ferruginous hawk	None/None G4/S3S4 WL	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.
Buteo swainsoni Swainson's hawk	None/ST G5/S3	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.
Circus hudsonius northern harrier	None/None G5/S3 SSC	Coastal salt & freshwater marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.
Coccyzus americanus occidentalis western yellow-billed cuckoo	FT/SE G5T2T3/S1	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.
Elanus leucurus white-tailed kite	None/None G5/S3S4 FP	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.
Eremophila alpestris actia California horned lark	None/None G5T4Q/S4 WL	Coastal regions, chiefly from Sonoma County to San Diego County. Also main part of San Joaquin Valley and east to foothills. Short-grass prairie, "bald" hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats.
Falco columbarius merlin	None/None G5/S3S4 WL	Seacoast, tidal estuaries, open woodlands, savannahs, edges of grasslands & deserts, farms & ranches. Clumps of trees or windbreaks are required for roosting in open country.
Icteria virens yellow-breasted chat	None/None G5/S3 SSC	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 ft of ground.

Lanius ludovicianus loggerhead shrike	None/None G4/S4 SSC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub & washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.
Laterallus jamaicensis coturniculus California black rail	None/ST G3G4T1/S1 FP	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.
Melospiza melodia song sparrow ("Modesto" population)	None/None G5/S3? SSC	Occupies thickets, brush, marshes, roadsides, gardens. Habitat varies over its wide range. In most areas, found in brushy fields, stream sides, shrubby marsh edges, woodland edges, hedgerows, well-vegetated gardens. Some coastal populations live in salt marshes. Nests in dense streamside brush in southwestern deserts, and in any kind of dense low cover.
Pandion haliaetus osprey	None/None G5/S4 WL	Ocean shore, bays, freshwater lakes, and larger streams. Large nests built in tree-tops within 15 miles of a good fish-producing body of water.
Riparia riparia bank swallow	None/ST G5/S2	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.
Setophaga petechia yellow warbler	None/None G5/S3S4 SSC	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.
Vireo bellii pusillus least Bell's vireo	FE/SE G5T2/S2	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, mesquite.
Xanthocephalus xanthocephalus yellow-headed blackbird	None/None G5/S3 SSC	Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds. Nests only where large insects such as Odonata are abundant, nesting timed with maximum emergence of aquatic insects.
Mammals		
Antrozous pallidus pallid bat	None/None G4/S3 SSC	Found in a variety of habitats including deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts in crevices of rock outcrops, caves, mine tunnels, buildings, bridges, and hollows of live and dead trees which must

		protect bats from high temperatures. Very sensitive to disturbance of roosting sites.
Corynorhinus townsendii Townsend's big-eared bat	None/None G4/S2 SSC	Occurs throughout California in a wide variety of habitats. Most common in mesic sites, typically coniferous or deciduous forests. Roosts in the open, hanging from walls & ceilings in caves, lava tubes, bridges, and buildings. This species is extremely sensitive to human disturbance.
Eumops perotis californicus western mastiff bat	None/None G4G5T4/S3S4 SSC	Occurs in open, semi-arid to arid habitats, including coniferous and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roosts in crevices in cliff faces and caves, and buildings. Roosts typically occur high above ground.
Neotoma fuscipes riparia riparian (=San Joaquin Valley) woodrat	FE/None G5T1Q/S1 SSC	Occurs in riparian habitats along the San Joaquin, Stanislaus, and Tuolumne rivers. Builds middens out of grasses, leaves, and woody debris.
Perognathus inornatus San Joaquin pocket mouse	None/None G2G3/S2S3	Grassland, oak savanna and arid scrubland in the southern Sacramento Valley, Salinas Valley, San Joaquin Valley and adjacent foothills, south to the Mojave Desert. Associated with fine-textured, sandy, friable soils.
Puma concolor Mountain lion (Southern California/Central Coast ESU	None/SC --/--	Found across California, often in areas where deer are present. Prime habitat including foothills and mountains.
Sylvilagus bachmani riparius riparian brush rabbit	FE/SE G5T1/S1	Riparian areas on the San Joaquin River in northern Stanislaus County. Dense thickets of wild rose, willows, and blackberries.
Taxidea taxus American badger	None/None G5/S3 SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.
Vulpes macrotis mutica San Joaquin kit fox	FE/ST G4T2/S2	Annual grasslands or grassy open stages with scattered shrubby vegetation. Need loose-textured sandy soils for burrowing, and suitable prey base.

FT = Federally Threatened
FC = Federal Candidate Species
FE = Federally Endangered
FS = Federally Sensitive
DL = Delisted
SSC = CDFW Species of Special Concern
SE = State Endangered
ST = State Threatened
SR = State Rare
SS = State Sensitive
SC = State Candidate
FP = Fully Protected

G-Rank/S-Rank = Global Rank and State Rank as per NatureServe and CDFW's CNDDB RareFind5

CRPR (California Rare Plant Rank):

1A=Presumed Extinct in California

1B=Rare, Threatened, or Endangered in California and elsewhere

2=Rare, Threatened, or Endangered in California, but more common elsewhere

3=Need more information (a Review List)

4=Plants of Limited Distribution (a Watch List)

CRPR Threat Code Extension:

.1=Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)

.2=Fairly endangered in California (20-80% occurrences threatened)

.3=Not very endangered in California (<20% of occurrences threatened)

Sources: CNDDB (CDFW, 2021a); USFWS (2021a), CDFW Special Animals List (2021). CDFW Special Plants List (2021) and CNPS Rare Plant Inventory (2021)