Draft

Program Environmental Impact Report

Southern California Association of Governments
2012-2035 Regional Transportation Plan/Sustainable Communities Strategy
December 2011 | State Clearinghouse # 2011051018

SOUTHERN CALIFORNIA
ASSOCIATION of GOVERNMENTS

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EXECUTIVE SUMMARY

In accordance with California Environmental Quality Act (CEQA) Guidelines Section 15123, this chapter of the Draft Program Environmental Impact Report (PEIR) contains an overview of the proposed project, its potential environmental effects and mitigation measures, and a summary of the alternatives to the proposed project evaluated in this Draft PEIR.

ES.1 INTRODUCTION

This PEIR evaluates the potential environmental impacts associated with the adoption of the 2012-2035 RTP/SCS by the Southern California Association of Governments (SCAG). SCAG prepared this PEIR, pursuant to the CEQA, for the 2012-2035 Regional Transportation Plan and Sustainable Communities Strategy (2012-2035 RTP/SCS, Plan or Project). The 2012-2035 RTP/SCS is a long-range regional transportation plan that provides a blueprint to help achieve a coordinated regional transportation system by creating a vision for transportation investment throughout the region and identifying regional transportation and land use strategies to address mobility needs. The 2012-2035 RTP/SCS includes goals, policies and performance indicators, identifies specific projects, programs and implementation, and includes a description of regional growth trends that identify future needs for travel and goods movement. The PEIR for the 2012-2035 RTP/SCS serves as an informational document to inform decision-makers and the public of the potential environmental consequences of approving the proposed Plan. The PEIR includes mitigation measures designed to help avoid or minimize significant environmental impacts.

A PEIR may serve as a first-tier document for later CEQA review of individual projects included in the program. These project-specific CEQA reviews will focus on project-specific impacts and mitigation measures, and need not repeat the broad analyses contained in the PEIR. As discussed by the California Supreme Court, "it is proper for a lead agency to use its discretion to focus a first-tier EIR on only the…program, leaving project-specific details to subsequent EIRs when specific projects are considered" (*In re Bay Delta* (2008) 43 Cal. 4th 1143, 1174).

As such, the focus of the environmental analysis in the PEIR is on regional-scale and cumulative impacts of implementation of the Plan and the alternatives. The long-range planning horizon of more than 20 years necessitates that many of the highway, arterial goods movement, and transit projects included in the Plan (and the alternatives) are identified at the conceptual level. This document addresses environmental impacts to the level that they can be assessed without undue speculation (CEQA Guidelines § 15145). This PEIR acknowledges this uncertainty and incorporates these realities into the methodology to evaluate the environmental effects of the Plan, given its long-term planning horizon.

The degree of specificity in an EIR corresponds to the degree of specificity of the underlying activity being evaluated (CEQA Guidelines Section 15146). Also, the adequacy of an EIR is determined in terms of what is reasonably feasible, in light of factors such as the magnitude of the project at issue, the severity of its likely environmental impacts, and the geographic scope of the project (CEQA Guidelines Sections 15151 and 15204(a)). The activity being evaluated in this PEIR is the long-term Regional Transportation Plan (RTP) including the Sustainable Communities Strategy (SCS). This Draft PEIR strives to provide as much quantitative detail as feasible regarding the regional environmental impacts of the Plan. Not all impacts can be feasibly and/or accurately quantitatively analyzed at a regional level and/or up to the year 2035.

A Notice of Preparation (NOP) for this Draft EIR was issued on May 10, 2011 by SCAG for a 30-day public review period. A total of 22 comment letters were received. Information, data and observations resulting from these letters are included throughout this Draft EIR where relevant. The NOP and copies of each

comment letter received are included in Appendix A of this Draft PEIR. Two scoping meetings were held on Thursday, May 26, 2011. The purpose of these meetings was to provide early consultation for the public to express their concerns about the proposed project, and acquire information and make recommendations on issues to be addressed in the Draft PEIR.

In accordance with Sections 15087 and 15105 of the CEQA Guidelines, this Draft PEIR is being circulated for a 45-day public review period. Responsible and trustee agencies and the public are invited to comment in writing on the information contained in this document. Persons and agencies commenting are encouraged to provide information that they believe is missing from the Draft PEIR and to identify where the information can be obtained. All comment letters received concerning the Draft PEIR will be responded to in writing, and the comment letters, together with the responses to those comments will be included in the Final PEIR.

ES.2 SUMMARY OF THE PROPOSED PROJECT

The 2012-2035 RTP/SCS provides land use and transportation recommendations to help achieve a coordinated balance of land uses and transportations such that vehicle trips and vehicle trip lengths are reduced and land is used efficiently and sustainably, thereby minimizing energy and water consumption. The 2012-2035 RTP/SCS contains transportation and urban form strategies that encourage compact growth, increased jobs/housing balance and transit-oriented development, where feasible, in all parts of the region. The 2012-2035 RTP/SCS is described in Chapter 2.0 Project Description.

ES.3 SIGNIFICANT AND UNAVOIDABLE IMPACTS

Section 15382 of the State CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of the physical conditions within an area affected by the project, including land, air, water, flora, fauna, ambient noise, and objects of historic or aesthetic significance." In order to approve a project with unavoidable and significant impacts, the lead agency must adopt a Statement of Overriding Considerations (in accordance with Section 15093 of the State CEQA Guidelines) indicating that the benefits of approving the proposed project outweigh the negative environmental consequences. Based on the analysis contained in this PEIR, the proposed project would create significant and unavoidable impacts related to the following topics:

- **Aesthetics** (Scenic Vistas, Scenic Highways, Visual Character, Light and Glare/Shade and Shadow)
- **Air Quality** (Criteria Pollutants Emissions and Construction Emissions)
- **Biological Resources and Open Space** (Special Status Species and Habitat, Natural Lands, Loss of Open Space)
- **Cultural Resources** (Historical Resources, Archeological Resources, Paleontological Resources and Human Remains)
- **Geology, Soils, and Mineral Resources** (Seismicity, Soil Erosion, Expansive Soils, and Aggregate and Mineral Resources)
- **Greenhouse Gas Emissions** (Total GHG Emissions and AB 32 Analysis)
- **Hazardous Materials** (Routine Transport, Upset and Accident Conditions, Contaminated Property, and Schools)
- **Land Use and Agricultural Resources** (Consistency with Plans and Policies, Division of Communities, and Agricultural and Farmlands)
- **Noise** (Construction Noise and Vibration, Land Use Compatibility, and Vibration)
- **Population, Housing and Employment** (Population and Displacement)
- **Public Services and Utilities** (Police, Fire Protection & Emergency Services, Wildfire Hazards, Educational Facilities, Recreational Facilities, Non-Renewable Energy Consumption)

- **Transportation, Traffic and Security** (Vehicle Miles Traveled, Truck Delay)
- **Water Resources** (Water Supply, Wastewater, Riparian Habitats, Groundwater, Water Quality, and Runoff/Drainage)

ES.4 LESS-THAN-SIGNIFICANT OR NO IMPACT

Based on the analysis contained in this Draft PEIR, the following were found to result in a less-than-significant impact or no impact:

- **Air Quality** (Change in Risk Levels Adjacent to the Freeway and Increased Population))
- **Greenhouse Gas Emissions** (SB 375 Analysis)
- **Transportation, Traffic and Security** (Worker Commute, Transportation System Fatality Rate, Transportation System Injury Rate)

ES.5 SUMMARY OF ALTERNATIVES

CEQA requires that an EIR describe a range of reasonable alternatives to the project or to the location of the project that could feasibly avoid or lessen significant environmental impacts while substantially attaining the basic objectives of the project. An EIR should also evaluate the comparative merits of the alternatives. The range of feasible alternatives is selected and discussed in a manner intended to foster meaningful public participation and informed decision making. Among the factors that may be taken into account when addressing the feasibility of alternatives (as described in CEQA Guidelines Section 15126.6[f][1]) are environmental impacts, site suitability, economic viability, availability of infrastructure, general plan consistency, regulatory limitations, jurisdictional boundaries, and whether the proponent could reasonably acquire, control, or otherwise have access to the alternative site. Alternatives considered for the proposed project are:

Alternative 1 – No Project Alternative. The **No Project Alternative** includes only those transportation projects that are under construction, undergoing right-of-way acquisition included in the first year of the previously conforming transportation plan and/or TIP, or have completed environmental review by December 2010. These reasonably foreseeable projects fulfill the definition of the CEQA-mandated "No Project Alternative." The growth scenario included in the No Project Alternative is based on 2008 RTP local input which was then adjusted to reflect 2012-2035 RTP/SCS regional population, housing and jobs totals.

Alternative 2 – Modified 2008 RTP Alternative. The Modified 2008 RTP Alternative is an update of the adopted 2008 RTP to reflect the most recent growth estimates and transportation planning decisions and assumptions. This alternative does not include urban form strategies included within SCS, but includes all of the modifications and projects in the 2008 RTP through RTP Amendment 4. The growth scenario for the 2008 Modified RTP Alternative is a combination of local input and existing general plan and land use data provided by local jurisdictions.

Alternative 3 – Envision 2 Alternative. The Envision 2 Alternative builds on the enhanced density and ideas of the SCS as described in the Plan and goes further. It includes far more aggressive densities than the 2012-2035 RTP/SCS, especially around High Quality Transit Areas (HQTAs), increases mobility, reduces emissions, and limits the development of single-family housing that would be built in the region. The Envision 2 transportation network is similar to the Plan network with minor changes to goods movement and transit projects. The growth network associated with Envision 2 maximizes urban centers, TODs and HQTAs; it also includes a more progressive jobs/housing distribution optimized for TOD and infill.

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
AESTHETICS AND VIEWS		
Potential to obstruct views of scenic resources or scenic vistas.	**MM-AV1:** Prior to the issuance of permits, project sponsors can and should require and projects should, to the extent feasible, construct noise barriers of materials whose color and texture complements the surrounding landscape and development. Noise barriers should be graffiti resistant and landscaped with plants that screen the barrier, preferably with either native vegetation or landscaping that complements the dominant landscaping of surrounding areas. Natural landscaping should be used to minimize contrasts between the project and surrounding areas. Wherever possible, interchanges and transit lines at the grade of the surrounding land should limit view blockage. **MM-AV2:** Project sponsors can and should use natural landscaping to minimize contrasts between the project and surrounding areas. Wherever possible, structures should be designed to limit view blockage. Edges of major cut-and-fill slopes should be contoured to provide a more natural looking finished profile. Project sponsors should replace and renew landscaping along corridors with road widenings, interchange projects, and related improvements. New corridor landscaping should be designed to respect existing natural and man-made features and to complement the dominant landscaping of surrounding areas. **MM-AV3:** Prior to project approval, project sponsors can and should implement design guidelines, local policies, and programs aimed at protecting views of scenic corridors and avoiding visual intrusions. Projects should be designed to minimize contrasts in scale and massing between the project and surrounding natural forms and developments. Avoid, if possible, large cuts and fills when the visual environment (natural or urban) would be substantially disrupted. Site or design of projects should minimize their intrusion into important viewsheds and use contour grading to better match surrounding terrain.	Significant and Unavoidable
Potential to alter the appearance of scenic resources along or near designated scenic highways and vista points.	**MM-AV4:** Project sponsors can and should construct sound walls of materials whose color and texture complements the surrounding landscape and development and use color, texture, and alternating facades to “break up” large facades and provide visual interest. Where there is room, project sponsors should landscape the sound walls with plants that screen the sound wall, preferably with either native vegetation or landscaping that complement the dominant landscaping of surrounding areas. **MM-AV5:** SCAG shall coordinate with Caltrans and local agencies as part of SCAG’s outreach and technical assistance to local governments under Compass Blueprint and Toolbox Tuesdays, to advocate that projects avoid locally designated scenic highways and/or vista points. Project sponsors can and should avoid construction of transportation facilities in state and locally designated scenic highways and/or vista points. When avoidance is not possible, project sponsors should minimize visual quality intrusions to the maximum extent feasible. **MM-AV6:** For projects in designated or eligible Scenic Highway corridors, prior to project approval, project sponsors can and should complete design studies and develop site-specific mitigation measures to minimize impacts on the quality of the views or visual experience that originally qualified the highway for scenic designation. **MM-AV7:** SCAG shall coordinate with Caltrans and local agencies as part of SCAG’s outreach and technical assistance to local governments under Compass Blueprint and Toolbox Tuesdays, to advocate that projects be consistent with applicable guidelines and regulations for the preservation of scenic resources along scenic highways. If projects are constructed in state- and locally-designated scenic highways and/or vista points, design, construction, and operation of the	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	transportation facility can and should be consistent with applicable guidelines and regulations for the preservation of scenic resources along the designated scenic highway.	
Potential to create significant contrasts with the overall visual character of the existing landscape setting or add urban visual elements to an existing natural, rural, and open space area.	**MM-AV8:** Project sponsors can and should design projects to minimize contrasts in scale and massing between the project and surrounding natural forms and development. Project sponsors should design projects to minimize their intrusion into important viewsheds and use contour grading to better match surrounding terrain. To the maximum extent feasible, landscaping along highway corridors should be designed to add significant natural elements and visual interest to soften the hard-edged, linear travel experience that would otherwise occur. **MM-AV9:** Project sponsors can and should develop design guidelines projects that make elements of proposed buildings/facilities visually compatible with surrounding areas. Visual design guidelines should, at a minimum, include setback buffers, landscaping, color, texture, signage, and lighting criteria. The following methods should be employed whenever possible: • Transportation systems should be developed to be compatible with the surrounding environment (i.e., colors and materials of construction material). • Vegetation used as screening and landscaping should blend in and complement the natural landscape. • Trees bordering highways should remain or be replaced so that clear-cutting is not evident. • Grading should blend with the adjacent landforms and topography. **MM-AV10:** In visually sensitive areas and prior to project approval, local land use agencies can and should apply development standards and guidelines to maintain compatibility with surrounding natural areas, including site coverage, building height and massing, building materials and color, landscaping, site grading, etc **MM-AV11:** Project sponsors can and should ensure that sites should be kept in a blight/nuisance-free condition. Any existing blight or nuisance should be abated within 60-90 days of approval, unless an earlier date is specified elsewhere.	Significant and Unavoidable
Potential to result in shade and shadow or light and glare impacts.	**MM-AV12:** Project sponsors can and should ensure that proposed lighting fixtures are adequately shielded to a point below the light bulb and reflector and that prevent unnecessary glare onto adjacent properties. Plans should be submitted to the Lead Agency (or other government agency as appropriate) for review and approval. All lighting should be architecturally integrated into the site.	Significant and Unavoidable
Potential to result in a cumulative loss of scenic resources.	See Mitigation Measures **MM-AV1** through **MM-AV12**.	Significant and Unavoidable
AIR QUALITY		
Mobile source emissions of ROG, NOX, CO, PM 10 PM2.5, and SOX would stay approximately the	**MM-AQ1:** Transportation Control Measures (TCMs) shall be implemented as appropriate by SCAG and can and should be implemented by local agencies and project sponsors as appropriate. TCMs included in the Plan are identified in the Transportation Conformity Appendix to the 2012-2035 RTP/SCS (starting on page 26). CAA Section 108(f)(1)(A) lists the following sixteen measures as illustrative of TCMs: I. Programs for improved use of public transit; II. Restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or HOV;	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
same or decrease (often substantially) when compared to existing conditions. This is considered to be a beneficial impact. Re-entrained roadway dust would increase proportionate to VMT. This would be a significant impact.	III. Employer-based transportation management plans, including incentives; IV. Trip-reduction ordinances; V. Traffic flow improvement programs that achieve emission reductions; VI. Fringe and transportation corridor parking facilities, serving multiple occupancy vehicle programs or transit service; VII. Programs to limit or restrict vehicle use in downtown areas or other areas of emission concentration, particularly during periods of peak use; VIII. Programs for the provision of all forms of high-occupancy, shared-ride services, such as the pooled use of vans; IX. Programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place; X. Programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas; XI. Programs to control extended idling of vehicles; XII. Programs to reduce motor vehicle emissions, consistent with Title II of the CAA, which are caused by extreme cold start conditions; XIII. Employer-sponsored programs to permit flexible work schedules; XIV. Programs and ordinances to facilitate non-automobile travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of transportation planning and development efforts of a locality, including programs and ordinances applicable to new shopping centers, special events, and other centers of vehicle activity; XV. Programs for new construction and major reconstruction of paths, tracks or areas solely for the use by pedestrian or other non-motorized means of transportation, when economically feasible and in the public interest; and XVI. Programs to encourage the voluntary removal from use and the marketplace of pre- 1980 model year light duty vehicles and pre-1980 model light duty trucks. The Plan has been prepared to facilitate implementation of TCMs and they also serve as air quality mitigation measures for the purposes of the PEIR. **MM-AQ2:** Local air districts, local jurisdictions and project sponsors can and should implement measures adopted by ARB designed to attain federal air quality standards for PM2.5 and 8-hour ozone. ARB's strategy includes the following elements: • Set technology forcing new engine standards; • Reduce emissions from the in-use fleet; • Require clean fuels, and reduce petroleum dependency; • Work with USEPA to reduce emissions from federal and state sources; and • Pursue long-term advanced technology measures. • Proposed new transportation–related SIP measures include : On-road Sources ✓ Improvements and Enhancements to California's Smog Check Program ✓ Expanded Passenger Vehicle Retirement ✓ Modifications to Reformulated Gasoline Program ✓ Cleaner In-Use Heavy-Duty Trucks ✓ Ship Auxiliary Engine Cold Ironing and Other Clean Technology ✓ Cleaner Ship Main Engines and Fuel	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	✓ Port Truck Modernization ✓ Accelerated Introduction of Cleaner Line-Haul Locomotives ✓ Clean Up Existing Commercial Harbor Craft Off-road Sources ✓ Cleaner Construction and Other Equipment ✓ Cleaner In-Use Off-Road Equipment ✓ Agricultural Equipment Fleet Modernization ✓ New Emission Standards for Recreational Boats ✓ Off-Road Recreational Vehicle Expanded Emission Standards **MM-AQ3:** Project sponsors can and should ensure that water or "toxic free" dust suppressants are applied to exposed earth surfaces to control emissions as necessary to control dust and comply with applicable regulations. **MM-AQ4:** Project sponsors can and should ensure that all excavating and grading activities should cease during second stage smog alerts and periods of high winds. **MM-AQ5:** Project sponsors can and should ensure that all trucks hauling dirt, sand, soil, or other loose materials off-site should be covered or wetted or should maintain at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer). **MM-AQ6:** Project sponsors can and should ensure that all construction roads that have high traffic volumes, should be surfaced with base material or decomposed granite, or should be paved or otherwise be stabilized. **MM-AQ7:** Project sponsors can and should ensure that public streets should be cleaned, swept or scraped at frequent intervals or at least three times a week if visible soil material has been carried onto adjacent public roads. **MM-AQ8:** Project sponsors can and should ensure that construction equipment should be visually inspected prior to leaving the site and loose dirt should be washed off with wheel washers as necessary. **MM-AQ9:** Project sponsors can and should ensure that water, hydroseed, or non-toxic soil stabilizers are applied to inactive construction areas as needed to reduce off-site transport of fugitive dust. **MM-AQ10:** Project sponsors can and should ensure that traffic speeds on all unpaved surfaces should not exceed 25 mph. **MM-AQ11:** Project sponsors can and should ensure that low sulfur or other alternative fuels or diesel powered vehicles with Tier 3 or better engines or retrofitted/repowered –to meet equivalent emissions standards as Tier 3 engines -should be used in construction equipment where feasible. **MM-AQ12:** Project sponsors can and should ensure that deliveries related to construction activities that affect traffic flow should be scheduled during off-peak hours (e.g., 10:00 a.m. and **3:**00 p.m.) and coordinated to achieve consolidated truck trips. When the movement of construction materials and/or equipment impacts traffic flow, temporary traffic control should be provided to improve traffic flow (e.g., flag person). **MM-AQ13:** Project sponsors can and should ensure that to the extent possible, construction activity should utilize electricity from power	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	poles rather than temporary diesel power generators and/or gasoline power generators. **MM-AQ14:** Local jurisdictions or agencies can and should, as practical and feasible, revegetate exposed earth surfaces following construction. Application of xeriscape principles, including such techniques and materials as native or low water use plants and low precipitation sprinklers heads, bubblers, drip irrigation systems and timing devices, should also be considered. **MM-AQ15:** Local jurisdictions can and should set specific limits on idling time for commercial vehicles, including delivery and construction vehicles. **MM-AQ16:** Project sponsors can and should ensure that sandbags or other erosion control measures are installed to prevent silt runoff to public roadways as needed. **MM-AQ17:** Project sponsors can and should designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties should include holidays and weekend periods when work may not be in progress. The name and telephone number of such persons should be provided to the local air district prior to the start of construction as well as posted on-site over the duration of construction. **MM-AQ18:** Project sponsors can and should ensure that appropriate wind-breaks are installed at the construction site to minimize windblown dust.	
Under the Plan, carcinogenic health risk related to air toxics within any given distance of mobile sources in the region would decrease when compared to existing conditions. Total acute and chronic risk associated with criteria pollutants from mobile sources at given distances would also decrease when compared to existing conditions. Non-carcinogenic health incidences due to VMT-related re-entrained dust would increase under the Plan. However, increases in these	Impacts related to health incidences were determined to be less than significant because of the decrease in risk at any given distance from freeways (due to emission controls).	Less Than Significant

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
health incidences would be at least partially offset by the decrease in health incidences related to air toxics and criteria pollutants generated by vehicle exhaust. (See also Impact 3.2-3 related to shifting populations.)		
Potential to increase population within 500 feet of transportation facilities that could expose residents (schools and other sensitive receptors) to elevated (as compared to average) cancer and other health risks.	**MM-AQ19:** In order to comply with the California Air Resources Board Air Quality and Land Use Handbook (June 2005) and achieve an acceptable interior air quality level for sensitive receptors, appropriate measures, project sponsors can and should be incorporated into project building design. The appropriate measures should include one of the following methods: a. The project sponsor should retain a qualified air quality consultant to prepare a health risk assessment (HRA) in accordance with the California Air Resources Board and the Office of Environmental Health and Hazard Assessment requirements to determine the exposure of project residents/occupants/users to stationary air quality polluters prior to issuance of a demolition, grading, or building permit. The HRA should be submitted to the Lead Agency for review and approval. The sponsor should implement the approved HRA recommendations, if any. If the HRA concludes that the air quality risks from nearby sources are at or below acceptable levels, then additional measures are not required. b. The project sponsor should implement the following features that have been found to reduce the air quality risk to sensitive receptors and should be included in the project construction plans. These should be submitted to the appropriate agency for review and approval prior to the issuance of a demolition, grading, or building permit and ongoing. i. Do not locate sensitive receptors near distribution center's entry and exit points. ii. Do not locate sensitive receptors in the same building as a perchloroleythene dry cleaning facility. iii. Maintain a 50 foot buffer from a typical gas dispensing facility (under 3.6 million gallons of gas per year). iv. 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. Either HEPA filters or ASHRAE 85% supply filters should be used. v. Retain a qualified HV consultant or HERS 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. vi. Maintain positive pressure within the building. vii. Achieve a performance standard of at least one air exchange per hour of fresh outside filtered air. viii. Achieve a performance standard of at least 4 air exchanges per hour of recirculation ix. Achieve a performance standard of .25 air exchanges per hour of in unfiltered infiltration if the building is not positively pressurized. c. Project sponsor should maintain, repair and/or replace HV system or prepare an Operation and Maintenance	Less Than Significant

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	Manual for the HV system and the filter. The manual should include the operating instructions and maintenance and replacement schedule. This manual should be included in the CC&R's for residential projects and distributed to the building maintenance staff. In addition, the sponsor should prepare a separate Homeowners Manual. The manual should contain the operating instructions and maintenance and replacement schedule for the HV system and the filters. It should also include a disclosure to the buyers of the air quality analysis findings. **MM-AQ20:** To the maximum extent practicable the Lead Agency can and should ensure that private (individual and common) exterior open space, including playgrounds, patios, and decks, should either be shielded from stationary source of air pollution by buildings or otherwise buffered to further reduce air pollution for project occupants.	
Emissions of short-term criteria pollutants would increase under the Plan as a result of construction of Plan transportation projects and development in the region. Therefore the Plan would result in a significant impact related to construction emissions.	See Mitigation Measures **MM-AQ1** through **MM-AQ18**.	Less Than Significant
Trains, airplanes, ships and stationary and area sources substantially contribute to emissions in the region; these sources are addressed by the applicable AQMPs and not substantially affected by the Plan. All such emissions are anticipated to be consistent with applicable AQMPs and SIPs and within regional conformity emission budgets. Therefore, the Plan	Impacts related to cumulatively considerable emissions were determined to be less than significant without mitigation.	Less Than Significant

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
would result in a less-than-significant impact related to cumulatively considerable emissions.		
BIOLOGICAL RESOURCES AND OPEN SPACE		
Potential to develop previously undisturbed land and displace natural vegetation, and thus habitat, which includes sensitive species habitat.	**MM-BIO/OS1:** Project sponsors can and should assess displacement of habitat due to removal of native vegetation during route planning/project location planning. Routes/project sites can and should be planned in coordination with state and local resources agencies and should consider inventories of natural resources, such as CDFG and CNDDB. Routes can and should be planned in order to avoid and/or minimize removal of native vegetation, by comparing proposed infrastructure with state and local conservation plans and by creating maps of resource habitat overlaid with the transportation network. Projects located in or adjacent to habitat areas can and should incorporate buffers to minimize lighting, noise, and other project impacts that can severely disrupt wildlife. Vegetation buffers can and should be appropriate to the adjacent vegetation association and protect the genetic integrity of the adjacent habitat. If avoidance is not possible, agencies/project sponsors can and should consult with the appropriate resource agencies to develop mitigation activities. **MM-BIO/OS2:** When avoidance of native vegetation removal is not possible, project sponsors can and should replant disturbed areas with commensurate native vegetation of high habitat value adjacent to the project (i.e., as opposed to ornamental vegetation with relatively less habitat value). When possible, habitat rehabilitation can and should use recycled material from rehabilitated infrastructure. **MM-BIO/OS3:** Project sponsors can and should include on-site habitat enhancement as a first priority and offsite habitat enhancement or restoration to compensate for unavoidable habitat losses from each project site as appropriate and necessary. **MM-BIO/OS4:** Pre-construction special status species surveys can and should be conducted by a qualified biologist to verify presence or absence of species at risk. Species surveys can and should occur during the portion of the species' life cycle where the species is most likely to be identified within the appropriate habitat. In all cases, impacts on special status species and/or their habitat can and should be avoided during construction to the maximum extent feasible. **MM-BIO/OS5:** For projects located in sensitive habitat areas, project sponsors can and should develop and implement a Worker Awareness Program (environmental education) to inform project workers of their responsibilities in regards to avoiding and minimizing impacts on sensitive biological resources. **MM-BIO/OS6** Project sponsors can and should appoint an Environmental Inspector to serve as a contact for issues that may arise concerning implementation of mitigation measures, and to document and report on adherence to these measures. **MM-BIO/OS7:** Project sponsors can and should schedule construction activities to avoid sensitive times for biological resources (e.g. steelhead spawning periods during the winter and spring) and to avoid the rainy season when erosion and sediment transport is increased.	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	MM-BIO/OS8: Project sponsors can and should schedule projects to avoid construction during critical life stages or sensitive seasons (e.g. the nesting season; see Mitigation Measures **MM-BIO/OS25**, and **MM-BIO/OS15** through **MM-BIO/OS35**). **MM-BIO/OS9:** Project sponsors can and should precede construction, as appropriate, by pre-construction monitoring to ensure no sensitive species' habitat would be unnecessarily destroyed (also see Mitigation Measures **MM-BIO/OS4** through **MM-BIO/OS13**). All discovered sensitive species habitat can and should be avoided where feasible, or disturbance should be minimized. **MM-BIO/OS10:** Project sponsors can and should fence and/or mark sensitive habitat to prevent unnecessary machinery or foot traffic during construction activities. **MM-BIO/OS11:** Project sponsors can and should ensure that sensitive habitats (native vegetative communities identified as rare and/or sensitive by the CDFG) and special-status plant species (including vernal pools) impacted by projects can and should be restored and augmented, if impacts are temporary, at a **1:**1 ratio (compensation acres to impacted acres). Permanent impacts can and should be compensated for by creating or restoring habitats at a **3:**1 ratio as close as possible to the site of the impact. The CDFG may recommend mitigation ratios that vary on a project-by-project basis and may exceed those recommended in Mitigation Measure **MM-BIO/OS17**. **MM-BIO/OS12:** When work is conducted in or adjacent to identified sensitive habitat areas, and/or areas of intact native vegetation, construction protocols can and should require the salvage of perennial plants and the salvage and stockpile of topsoil (the surface material from 6 to 12 inches deep) and can and should be used in restoring native vegetation to all areas of temporary disturbance within the project area. **MM-BIO/OS13:** When removal and/or damage to sensitive species habitat are unavoidable during construction, project sponsors can and should ensure that any disturbed natural areas are replanted with appropriate native vegetation following the completion of construction activities. In the case of permanent losses to sensitive species habitat, mitigation can and should follow the offsite habitat compensation guidance. **MM-BIO/OS14:** A qualified wetland scientist can and should review construction drawings as part of each project-specific environmental analysis to determine whether wetlands will be impacted, and if necessary, perform a formal wetland delineation. Appropriate state and federal permits can and should be obtained, but each project EIR will contain language clearly stating the provisions of such permits, including avoidance measures, restoration procedures, and in the case of permanent impacts compensatory creation or enhancement measures to ensure a no net loss of wetland extent or function and values. **MM-BIO/OS15:** Suitable habitat for listed vernal pool crustaceans can and should be avoided to the extent feasible. If infeasible, impacts should be mitigated in accordance with the Programmatic Biological Opinion (PBO) for vernal pool invertebrates, issued by the USFWS Sacramento Field Office in 1995. Surveys should be conducted, with USFWS approval, in accordance with the 1996 *Interim Survey Guidelines to Permittees for Recovery Permits under* Section 10(a)(1)(A) *of the Endangered Species Act for the Listed Vernal Pool Branchiopods,* to establish whether or not listed invertebrates are present. **MM-BIO/OS16:** Project sponsors can and should avoid removal of wetland or riparian vegetation. Specific vegetation that is not to be removed should be so marked during construction. Wetland and riparian vegetation removal should be minimized as	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	much as possible. **MM-BIO/OS17:** Project sponsors can and should replace any disturbed wetland, riparian or aquatic habitat, either on-site or at a suitable off-site location at ratios to ensure no net loss. See Mitigation Measures **MM-BIO/OS1** through **MM-BIO/OS14**. **MM-BIO/OS18:** Project sponsors can and should ensure that when individual projects include unavoidable losses of riparian or aquatic habitat, adjacent or nearby riparian or aquatic habitat should be enhanced (e.g., through removal of non-native invasive wetland species and replacement with more ecologically valuable native species). **MM-BIO/OS19:** For projects near water resources project sponsors can and should implement Best Management Practices (BMPs) at construction sites to minimize erosion and sediment transport from the area. BMPs include encouraging growth of vegetation in disturbed areas, using straw bales or other silt-catching devices, and using settling basins to minimize soil transport. (See also Water Resources Mitigation Measures.) Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of **3:**1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS. **MM-BIO/OS20:** If specific project area trees are designated as “Landmark Trees” or “Heritage Trees”, then approval for removals can and should be obtained through the appropriate entity, and appropriate mitigation measures can and should be developed at that time, to ensure that the trees are replaced. Mitigation trees can and should be locally-collected native species. **MM-BIO/OS21:** Retention of trees on-site can and should be prioritized consistent with local regulations. Adequate protection can and should be provided during the construction period for any trees that are to remain standing, including the following, plus any recommendations of an arborist: a. Before the start of any clearing, excavation, construction or other work on the site, every protected tree deemed to be potentially endangered by said site work, can and should be securely fenced off. Such fences can and should remain in place for duration of all such work. All trees to be removed can and should be clearly marked. A scheme can and should be established for the removal and disposal of logs, brush, earth and other debris that will avoid injury to any protected tree. b. Where proposed development or other site work could encroach upon the protected perimeter of any protected tree, special measures can habitat for listed vernal pool crustaceans can and should be avoided to the extent feasible. If infeasible, impacts should be mitigated in accordance with the Programmatic Biological Opinion (PBO) for vernal pool invertebrates, issued by the USFWS Sacramento Field Office in 1995. Surveys should be conducted, with USFWS approval, in accordance with the 1996 *Interim* and should be incorporated to allow the roots to breathe and obtain water and nutrients. Any excavation, cutting, filing, or compaction of the existing ground surface within the protected perimeter should be minimized. No change in existing ground level should occur from the base of any protected tree at any time. No burning or use of equipment with an open flame should occur near or within the protected perimeter of any protected tree. c. No storage or dumping of oil, gas, chemicals, or other substances that may be harmful to trees should occur from the base of any protected trees, or any other location on the site from which such substances might enter the protected perimeter. No heavy construction equipment or construction materials should be operated or stored within a distance	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	from the base of any protected trees. Wires, ropes, or other devices should not be attached to any protected tree, except as needed for support of the tree. No sign, other than a tag showing the botanical classification, should be attached to any protected tree. d. Periodically during construction, the leaves of protected trees can and should be thoroughly sprayed with water to prevent buildup of dust and other pollution that would inhibit leaf transpiration. e. If any damage to a protected tree should occur during or as a result of work on the site, the project sponsor can and should immediately notify the appropriate local agency of such damage. If, such tree cannot be preserved in a healthy state, the local agency can and should require replacement of any tree removed with another tree or trees on the same site deemed adequate by the local agency to compensate for the loss of the tree that is removed. f. All debris created as a result of any tree removal work can and should be removed by the project sponsor from the property within two weeks of debris creation, and such debris can and should be properly disposed of by the project sponsor in accordance with all applicable laws, ordinances, and regulations. **MM-BIO/OS22:** Project sponsors with projects within the range and within suitable habitat for species listed as threatened or endangered under California Endangered Species Act (such as the Mohave ground squirrel) or the Federal Endangered Species Act (such as the Arroyo toad) can and should conduct surveys, with CDFG and/or USFWS approval, in accordance with established and approved survey methods appropriate for the species of interest, such as the 1999 USFWS *Survey Protocol for the Arroyo Toad,* to establish whether or not the species is present. If species is determined present then the following applies: • A pre-construction survey shall be conducted by a qualified biologist at each site to identify suitable habitat for the species of interest and to determine what avoidance measures, including relocation, fencing installation, and avoidance of breeding season will be required. • Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of **3:**1 (compensation acres to that impacted)) or other similar ratio with the approval of the USFWS and/or CDFG). • Project sponsors must obtain an Incidental Take Permit under Section 2081 of the Fish and Game Code before proceeding with authorization of any project subject to CESA. Additional authorization may be required by the USFWS for take of federal-listed species or their occupied habitat. **MM-BIO/OS23:** Project sponsors with projects within the range and within suitable habitat for the blunt-nosed leopard lizard can and should conduct surveys, with USFWS approval, in accordance with the 2004 CDFG *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard,* to establish whether or not the species is present. If species is determined present then the following applies: Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of **3:**1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG). No direct taking of the blunt-nosed leopard lizard should occur as this is a CDFG fully protected species with no regulatory mechanism to authorize direct taking (killing) of individuals. **MM-BIO/OS24:** Project sponsors with projects within the range and within suitable habitat for the California red-legged frog can and should implement the measures detailed in the Programmatic Biological Opinion (PBO) for construction impacts to the red-legged frog that was issued by the USFWS (Federal Register 1999) to the USACE. The measures listed below are taken largely from the PBO and, if applied to the western pond turtle as well as the frog, would be adequate as	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	standard mitigation for both species. A similar level of effort for survey protocol can also be applied to the Mountain yellow-legged frog, with adjustments to its climate, habitat, and breeding requirements. • The name and credentials of a biologist qualified to act as a construction monitor will be submitted to USFWS for approval at least 15 days prior to commencement of work; • The USFWS-approved biologist can and should survey the site two weeks prior to the onset of work activities and immediately prior to commencing work. If red-legged frog adults, tadpoles, or eggs are found, the approved biologist can and should contact USFWS to determine whether relocating any life stages is appropriate; • The USFWS-approved biologist can and should ensure that the introduction or spread of invasive exotic plant species is avoided to the maximum extent possible, by removing weeds from areas of exposed bare soil within the construction zone where construction occurs in riparian vegetation. • The number and size of access routes, staging areas, and total area of activity should be limited to the minimum necessary to achieve the project goal; • If work sites require dewatering, the intakes can and should be screened with a maximum mesh sizes of 5 millimeters; • The USFWS-approved biologist can and should permanently remove and destroy from within the project area any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent practicable. **MM-BIO/OS25:** Project sponsors with projects within the range and within suitable habitat for the California tiger salamander can and should conduct surveys, with USFWS approval, in accordance with the 2003 USFWS *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander,* to establish whether or not the species is present. In addition to measures described for the California red-legged frog, which would also serve to protect the California tiger salamander, the following measures can and should be implemented to further minimize adverse effects to the California tiger salamander. • A pre-construction survey can and should be conducted at each site to identify suitable pond and upland burrow aestivation areas. As feasible within the context of the work area, aestivation areas should be temporarily fenced and avoided. • At locations where upland aestivation habitat is identified and cannot be avoided, aestivation burrows can and should be excavated by hand prior to construction and individual animals moved to natural burrows or artificial burrows constructed of PVC pipe within 0.25 miles of the construction site as approved by the USFWS. • To ensure compliance with these measures and minimize California tiger salamander take, a qualified biological monitor can and should be present during all new site disturbance construction activities (vegetation removal, clearing, grubbing, grading) at locations with suitable upland aestivation habitat. • Impacts on breeding ponds can and should be avoided until the ponds have dried. • Upon approval by the USFWS, preconstruction surveys to salvage and relocate individual California tiger salamanders can and should include installation of drift fences and pitfall traps within construction sites to identify and relocate animals. Following removal of individuals, construction areas should be fenced with temporary exclusionary silt fencing. • Temporary impacts on upland aestivation habitat can and should be restored to grassland habitat. • Mitigation for occupied habitat permanently impacted is likely to be compensatory off-site acquisition or protection of	

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Impact	Mitigation Measures	Significance After Mitigation
	similar habitats at a ratio of **3:**1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG). **MM-BIO/OS26:** Project sponsors with projects within the range and within suitable habitat for the Coachella Valley fringe-toed lizard can and should conduct surveys, with USFWS/CDFG approval, in accordance with the CDFG *Protocol for Determining Coachella Valley Fringe-Toed Lizard (CVFTL) Presence,* to establish whether or not the species is present. The measures listed below are taken largely from the CDFG protocol recommendations and would be adequate as standard mitigation for this species. If the species is determined present then the following applies: • Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of **3:**1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG). **MM-BIO/OS27:** Project sponsors with projects within the range and within suitable habitat for the desert tortoise can and should conduct surveys, with USFWS approval, in accordance with the 1992 USFWS *Field Survey Protocol For Any Federal Action That May Occur Within The Range Of The Desert Tortoise,* to establish whether or not the species is present. If the species is determined present then the following applies: • Upon approval by the USFWS, preconstruction surveys of project impact areas can and should be required to salvage and relocate individual desert tortoise out of harms. Following removal of individuals, construction areas should be fenced with temporary exclusionary silt fencing. Mitigation for occupied habitat impacted is likely to be compensatory acquisition of mitigation credits or off-site acquisition or protection of similar habitats at a ratio of **3:**1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG). **MM-BIO/OS28:** California species of special concern (CSC), such as the two-striped garter snake and several bat species are considered special-status species that meet the definition of rare, threatened or endangered species for the purposes of CEQA. Projects within the range and within suitable habitat for California species of special concern can and should conduct surveys in accordance with the best professional judgment of a qualified biologist. The following measures can and should be implemented to further minimize adverse effects to CSC species: • Preconstruction surveys of project impact areas can and should be required to salvage and relocate individual two-striped garter snakes out of harm. Following removal of individuals, construction areas should be fenced with temporary exclusionary silt fencing. • Similarly appropriate survey, salvage, and mitigation measures can and should be taken with regard to other CSC classified species. If avoidance of impacts to species is not feasible, on site and/or off site protection of appropriate mitigation lands in perpetuity should be secured for these species. • Mitigation for occupied habitat is likely to be compensatory acquisition of mitigation credits or off-site acquisition or protection of similar habitats at a ratio of **3:**1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG. The two-striped garter snake is not formally listed but considered a special-status species worthy of measures to avoid and minimize impacts to the extent feasible.	

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Impact	Mitigation Measures	Significance After Mitigation
	MM-BIO/OS29: Project sponsors can and should ensure that to avoid disrupting nesting Swainson's hawks, construction activities at known nesting locations can and should occur between September and March outside the nesting season (nesting typically occurs from March 1 through September 1). Alternatively, if construction activities take place during the nesting season, a qualified biologist can and should conduct a pre-construction survey no more than two weeks before the start of construction for any given milepost and report whether or not there are nesting Swainson's hawks within 500 feet of any project (assuming available authorized access). If there are nesting Swainson's hawks present within the 500-foot buffer areas, construction will be delayed until the CDFG has been consulted to determine suitable avoidance measures. A potential avoidance measure may include delaying all construction activity within 500 feet of an active Swainson's hawk nest until the adult and/or young of the year are no longer reliant on the nest site for survival as determined by a qualified biologist. **MM-BIO/OS30:** Project sponsors can and should ensure that no more than two weeks before construction in any given milepost, a survey for burrows and burrowing owls can and should be conducted by a qualified biologist within 500 feet of the project (assuming available authorized access). The survey will conform to the protocol described by the California Burrowing Owl Consortium's 1993 Burrowing Owl Protocol and Mitigation Guideline which includes up to four surveys on different dates if there are suitable burrows present as well as the CDFG's 1995 Staff Report on Burrowing Owl Mitigation. Both mitigation guidelines also recommend habitat land acquisition and protection in perpetuity for project-related loss of occupied wintering and breeding habitat for burrowing owls. If occupied burrowing owl dens are found within the survey area, a determination can and should be made by a qualified biologist in consultation with CDFG whether or not project work will impact the occupied burrows or disrupt reproductive behavior. • If it is determined that construction will not impact occupied burrows or disrupt breeding behavior, construction will proceed without any restriction or mitigation measures. • If it is determined that construction will impact occupied burrows during August through February, the subject owls will be passively relocated from the occupied burrow(s) using one-way doors. There should be at least two unoccupied burrows suitable for burrowing owls within 300 feet of the occupied burrow before one-way doors are installed. Artificial burrows should be in place at least one-week before one-way doors are installed on occupied burrows. One-way doors will be in place for a minimum of 48 hours before burrows are excavated. • If it is determined that construction will physically impact occupied burrows or disrupt reproductive behavior during the nesting season (March through July) then avoidance is the only mitigation available. Construction should be delayed within 300 feet of occupied burrows until it is determined that the subject owls are not nesting or until a qualified biologist determines that juvenile owls are self-sufficient or are no longer reliant on the natal burrow as their primary source of shelter and survival. • Mitigation for occupied habitat is likely to be compensatory acquisition of mitigation credits or off-site acquisition or protection of similar habitats at a ratio of **3:**1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG. **MM-BIO/OS31:** Project sponsors can and should ensure that when working within 100 feet of salt or brackish marshland presence for the California black rail, California clapper rail, and Yuma clapper rail should be assumed for either species during the period February 1- August 31 and construction should be scheduled to begin no earlier than September 1 and end no later than January 31 to avoid potential impact on reproduction. The Department of Fish and Game and United States Fish and Wildlife Service can and should be consulted when projects identify occupied habitat or habitat capable of	

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Impact	Mitigation Measures	Significance After Mitigation
	supporting California clapper rail, light-footed clapper rail, and Yuma clapper rail. **MM-BIO/OS32:** Project sponsors with projects within the range and within suitable habitat for the coastal California gnatcatcher can and should conduct surveys, with USFWS approval, in accordance with the 1997 USFWS *Coastal California Gnatcatcher Presence/Absence Survey Guidelines,* to establish whether or not the species is present. If the species is determined present then the following applies: • To avoid disrupting nesting coastal California gnatcatchers, construction activities at known nesting locations should occur between September and March outside the nesting season (nesting typically occurs from March 1 through September 1). Alternatively, if construction activities take place during the nesting season, a qualified biologist can and should conduct a pre-construction survey no more than two weeks before the start of construction for any given milepost and report whether or not there are nesting coastal California gnatcatchers within 500 feet of any project (assuming available authorized access). If there are nesting coastal California gnatcatchers present within the 500-foot buffer areas, construction will be delayed until the USFWS and/or CDFG has been consulted to determine suitable avoidance measures. A potential avoidance measure may include delaying all construction activity within 500 feet of an active coastal California gnatcatchers nest until the adults and/or young of the year are no longer reliant on the nest site for survival as determined by a qualified biologist. • Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of **3:**1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG). **MM-BIO/OS33:** Project sponsors with projects within the range and within suitable habitat for the least Bell's vireo can and should conduct surveys, with USFWS approval, in accordance with the 2001 USFWS *Least Bell's Vireo Survey Guidelines,* to establish whether or not the species is present. If the species is determined present then the following applies: • To avoid disrupting nesting least Bell's vireo, construction activities at known nesting locations can and should occur between September and March outside the nesting season (nesting typically occurs from March 1 through September 1). Alternatively, if construction activities take place during the nesting season, a qualified biologist can and should conduct a pre-construction survey no more than two weeks before the start of construction for any given milepost and report whether or not there are nesting least Bell's vireo within 500 feet of any project (assuming available authorized access). If there are nesting least Bell's vireo present within the 500-foot buffer areas, construction will be delayed until the CDFG has been consulted to determine suitable avoidance measures. A potential avoidance measure may include delaying all construction activity within 500 feet of an active least Bell's vireo nest until the adults and/or young of the year are no longer reliant on the nest site for survival as determined by a qualified biologist. • Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of **3:**1 (compensation acres to that impacted or other similar ratio with the approval of the USFWS and/or CDFG). **MM-BIO/OS34:** Project sponsors with projects within the range and within suitable habitat for the southwestern willow flycatcher can and should conduct surveys, with USFWS approval, in accordance with the 2000 USFWS *Southwestern Willow Flycatcher Protocol Survey Guidelines (Revision 2000),* to establish whether or not the species is present. If the species	

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Impact	Mitigation Measures	Significance After Mitigation
	is determined present then the following applies: • To avoid disrupting nesting southwestern willow flycatcher, construction activities at known nesting locations can and should occur between September and March outside the nesting season (nesting typically occurs from March 1 through September 15). Alternatively, if construction activities take place during the nesting season, a qualified biologist can and should conduct a pre-construction survey no more than two weeks before the start of construction for any given milepost and report whether or not there are nesting southwestern willow flycatcher within 500 feet of any project (assuming available authorized access). If there are nesting southwestern willow flycatchers present within the 500-foot buffer areas, construction will be delayed until the CDFG has been consulted to determine suitable avoidance measures. A potential avoidance measure may include delaying all construction activity within 500 feet of an active southwestern willow flycatcher nest until the adults and/or young of the year are no longer reliant on the nest site for survival as determined by a qualified biologist. • Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of **3:**1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG). **MM-BIO/OS35:** Project sponsors can and should ensure that suitable nesting sites for migratory nongame native bird species protected under the Federal Migratory Bird Treaty Act and/or trees with unoccupied raptor nests (large stick nests or cavities) should only be removed prior to February 1, or following the nesting season. A survey to identify active raptor and other migratory nongame bird nests can and should be conducted by a qualified biologist at least two weeks before the start of construction at project sites from February 1st through August 31st Active raptor nests can and should be re-located within 500 feet of the project to the extent feasible and assuming available authorized access. Suitable nesting habitat for protected native birds can and should be re-located within 300 feet of the project. • Beginning thirty days prior to the disturbance of suitable nesting habitat, the project sponsor can and should arrange for weekly bird surveys conducted by a qualified biologist with experience in conducting breeding bird surveys to detect protected native birds occurring in the habitat that is to be removed and any other such habitat within 300 feet of the construction work area (within 500 feet for raptors) as access to adjacent areas allows. The last survey can and should be conducted no more than 3 days prior to the initiation of clearance/construction work. • If an active raptor nest is found within 500 feet of the project or nesting habitat for a protected native bird is found within 300 feet of the project a determination can and should be made by a qualified biologist in consultation with CDFG whether or not project construction work will impact the active nest or disrupt reproductive behavior. • If it is determined that construction will not impact an active nest or disrupt breeding behavior, construction will proceed without any restriction or mitigation measure. If it is determined that construction will impact an active raptor nest or disrupt reproductive behavior then avoidance is the only mitigation available. Construction can and should be delayed within 300 feet of such a nest (within 500 feet for raptor nests), until August 31 or as determined by CDFG, until the adults and/or young of the year are no longer reliant on the nest site for survival and when there is no evidence of a second attempt at nesting as determined by a qualified biologist. Limits of construction to avoid a nest can and should be established in the field with flagging and stakes or construction fencing marking the protected area 300 feet (or 500 feet) from the nest. Construction personnel can and should be instructed on the sensitivity of the area.	

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Impact	Mitigation Measures	Significance After Mitigation
	• Documentation to record compliance with applicable State and Federal laws pertaining to the protection of native birds can and should be recorded. **MM BIO/OS 44** through **MM BIO/OS 46**, **MM-BIO/OS49**, **MM-BIO51** through **MM-BIO53** and **MM-BIO/OS55** through **MM-BIO/OS59** would also address thus impact.	
Potential to contribute to the fragmentation of existing habitat, decreasing habitat sizes, reducing habitat connectivity, and causing direct injury to wildlife. The 2012-2035 RTP/SCS includes new transportation corridors and development that may form barriers to animal migration and/or foraging routes.	Mitigation Measures **BIO/OS 1** through **BIO/OS 35** above would also address this impact. **MM-BIO/OS36:** Project sponsors can and should conduct site-specific analyses of opportunities to preserve or improve habitat linkages with areas on- and off-site. Habitat linkages/wildlife movement corridors can and should be analyzed on a broader and cumulative impact analysis scale to avoid adverse impacts from linear projects that have potential for impacts on a broader scale or critical narrow choke points that could reduce function of recognized movement corridors on a larger scale. A qualified biologist will review construction drawings and habitat connectivity mapping provided by the CDFG or CNDDB will be used to determine the risk of habitat fragmentation. Mitigation banking to preserve habitat linkages and corridors (opportunities to purchase, maintain, and/or restore off-site habitat) is one opportunity that project sponsor and local jurisdictions may pursue. **MM-BIO/OS37:** Project sponsors can and should evaluate the potential for overpasses, underpasses, and culverts in cases where a roadway or other transportation project may interrupt the flow of species through their habitat. Wildlife crossings/access can and should be provided in accordance with proven standards, such as FHWA's Critter Crossings or Ventura County Mitigation Guidelines and in consultation with wildlife corridor authorities with sufficient knowledge of both regional and local wildlife corridors, and at locations useful and appropriate for the species of concern. **MM-BIO/OS38:** Project sponsors can and should include analysis of wildlife corridors during project planning. Impacts to these corridors should be avoided and/or minimized. **MM-BIO/OS39:** Project sponsors can and should use wildlife fencing where appropriate to minimize the probability of wildlife injury due to direct interaction between wildlife and roads. Wildlife fencing used can and should be based on proven designs for impacted species and developed in conjunction with wildlife corridor authorities with sufficient knowledge of both regional and local wildlife corridors. Project sponsors can and should take advantage of natural environmental buffers (i.e. streams or fields) to protect wildlife habitat from nearby transportation infrastructure. Inclusion of this mitigation measure can and should be considered on a case-by-case basis, as use of wildlife fencing could further increase the effects of habitat fragmentation and isolation for many species. Also see **MM-BIO/OS1** through **MM-BIO/OS21**. **MM-BIO/OS40:** Project sponsors can and should avoid siting new 2012-2035 RTP/SCS transportation facilities within areas not presently exposed to impacts from transportation facilities. If avoidance is infeasible, the project should minimize vehicular accessibility to areas beyond the actual transportation surface. This can be accomplished through fencing and signage. Additionally, the area of native habitats to be lost to proximity to a transportation facility should be assessed and habitat at a quality of equal or superior value can and should be secured and protected in perpetuity.	Significant and Unavoidable
Potential to increase near-road human disturbances such as	**MM-BIO/OS41:** Project sponsors can and should establish litter control programs in appropriate areas, such as receptacles at road turnouts, rest stops, and viewpoints. All refuse containers can and should be provided with mechanisms which prevent scavenging animals from gaining access to the contents of such containers.	Significant and Unavoidable

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Impact	Mitigation Measures	Significance After Mitigation
litter, trampling, light pollution, and road noise in previously relatively inaccessible and undisturbed natural areas.	**MM-BIO/OS42:** Project sponsors can and should use road noise minimization methods, such as brush and tree planting, at heavy noise-producing transportation areas that might affect wildlife. Native vegetation can and should be used.	
Potential to increase near-road human disturbances such as litter, trampling, light pollution, and road noise in previously relatively inaccessible and undisturbed natural areas.	**MM-BIO/OS1** through **MM-BIO/OS42** would also address this impact.	Significant and Unavoidable
Potential to damage natural vegetation and other habitat components as a result of trampling or off-road machinery during construction activities. Direct fatalities to wildlife would also potentially occur.	**MM-BIO/OS7, MM-BIO/OS8, MM-BIO/OS 10, MM-BIO/OS12,** and **MM-BIO/OS13** would also address this impact. **MM-BIO/OS43:** Project sponsors can and should avoid and/or minimize construction activities that have the potential to expose species to noise, smoke, or other disturbances. Pre-construction surveys can and should be conducted as appropriate to determine the presence of any species that would need to be protected from such an impact.	Significant and Unavoidable
Potential to create noise, smoke, lights and/or other disturbances to biological resources during construction and operation of projects.	**MM-BIO/OS7** through MM-**BIO/OS9**, **MM-BIO/OS12**, **MM-BIO/OS13**, and **BIO/OS43** would also address this impact.	Significant and Unavoidable
Potential to displace riparian or wetland habitat.	**MM-BIO/OS11** through MM-**BIO/OS19** would also address this impact.	Significant and Unavoidable
Potential to increase	**MM-BIO/OS-50** below would also address this impact.	Significant

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Impact	Mitigation Measures	Significance After Mitigation
siltation of streams and other water resources from exposures of erodible soils during construction activities.		and Unavoidable
Conflict with any provisions of an adopted Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP).	No direct impacts to existing HCPs and NCCPs are anticipated.	Less than Significant
Substantial disturbance and/or loss of open space and rangelands used for foraging.	**MM-BIO/OS46** through MM-**BIO/OS49** and **MM-BIO/OS54** would also address this impact**.**	Significant and Unavoidable
Potential to contribute to a cumulatively considerable loss of habitat and biological resources..	**MM-BIO/OS44:** Future impacts to biological resources shall be minimized through cooperation, information sharing, and program development as part of SCAG's regional planning efforts. SCAG shall consult with the resource agencies, such as USFSW and CDFG, as well as local jurisdictions to incorporate any local HCPs or other similar planning documents. Planning efforts shall be in accordance with the approach outlined in the California Wildlife Action Plan. **MM-BIO/OS45:** SCAG shall develop a conservation strategy in coordination with local jurisdictions and agencies, including CTCs to determine priority conservation areas and develop regional mitigation policies. SCAG shall produce and maintain a list/map of potential conservation opportunity areas based on most recent land use data. These conservation opportunity areas may be used by local jurisdictions and project sponsors as priority areas for mitigating impacts to open space resources. SCAG's forthcoming regional conservation planning policy will include additional information on conservation opportunity areas. **MM-BIO/OS46:** SCAG shall use its IGR process to review projects with potentially significant impacts to open space and recommend impact avoidance and mitigation measures. **MM-BIO/OS47:** Project sponsors can and should ensure that transportation systems proposed in the 2012-2035 RTP/SCS avoid or mitigate significant impacts to natural lands, community open space and important farmland, including cumulative impacts and open space impacts from the growth associated with transportation projects and improvements. **MM-BIO/OS48:** Individual projects submitted for IGR review can and should either avoid significant impacts to regionally significant open space resources or mitigate the significant impacts through measures consistent with regional open space policies for conserving natural lands, community open space and farmlands. All projects submitted for IGR review can and should demonstrate consideration of alternatives that would avoid or reduce impacts to open space.	Significant and Unavoidable

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Impact	Mitigation Measures	Significance After Mitigation
	MM-BIO/OS49: Project sponsors can and should include into project design, to the maximum extent practicable, mitigation measures and recommended best practices aimed at minimizing or avoiding impacts to natural lands, including, but not limited to FHWA's Critter Crossings, Ventura County Mitigation Guidelines, CDFG's Wildlife Action Plan and any applicable conservation plans. **MM-BIO/OS50**: For projects adjacent to natural watercourses, project sponsors can and should submit a vegetation management plan for review and approval by the Lead Agency that includes, as deemed appropriate, the following measures: • Identify and do not disturb a 20-foot buffer from the top of the natural watercourse. If the top of bank cannot be identified, leave a 50-foot buffer from the centerline of the watercourse or as wide a buffer as possible between the watercourse centerline and the proposed site development. • Identify and leave" islands" of vegetation in order to prevent erosion and landslides and protect nesting habitat. • Leave at least 6 inches of vegetation on the site. • Trim tree branches from the ground up (limbing up) and leave tree canopy intact. • Leave stumps and roots from cut down trees to prevent erosion. • Plant fire-appropriate, drought-tolerant, preferably native vegetation. • Err on the side of caution; if a plant, tree or area is sensitive, obtain a second opinion before cutting. • Provide erosion and sediment control protection if cutting vegetation on a steep slope. • Leave tall shrubbery at least 3-feet high. • Fence off sensitive plant habitats and creek areas to protect from animal grazing as appropriate and necessary. • Do not clear-cut vegetation. This can lead to erosion and severe water quality problems and destroy important habitat. • Do not remove vegetation within 20-feet of the top of bank. If the top of bank cannot be identified, do not cut within 50-feet of the centerline of the natural watercourse or as wide a buffer as possible between the natural watercourse centerline and the proposed site development. • Do not trim/prune branches that are larger than 4 inches in diameter. • Do not remove tree canopy. • Do not dump cut vegetation in a creek. • Do not cut tall shrubbery to less than 3-feet high. • Do not cut of short vegetation (grasses, ground-cover) to less than 6-inches high. **MM-BIO/OS51:** As appropriate conduct a biological assessment for any site/corridor where there is the potential for impacts to significant biological resources including threatened or endangered species, sensitive habitats/species and/or protected trees. **MM-BIO/OS52: Shade Tree Planting:** Local jurisdictions or agencies can and should promote the planting of shade trees and establish shade tree guidelines and specifications, including: • Recommendations for tree planting based on the land use (residential, commercial, parking lots, etc.); • Recommendations for tree types based on species size, branching patterns, whether deciduous or evergreen, whether roots are invasive, etc.; • Recommendations for placement, including distance from structures, density of planting, and orientation relative to structures and the sun.	

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Impact	Mitigation Measures	Significance After Mitigation
	MM-BIO/OS53: Urban Forestry Management: Local jurisdictions or agencies can and should develop an Urban Forestry Program to consolidate policies and ordinances regarding tree planting, maintenance, and removal, including: • Establish a tree-planting target and schedule to support the goals of the California Climate Action Team to plant 5 million trees in urban areas by 2020; • Establish guidelines for tree planting, including criteria for selecting deciduous or evergreen trees low-VOC-producing trees, and emphasizing the use of drought-tolerant native trees and vegetation. **MM-BIO/OS54:** Local jurisdictions or agencies can and should establish policies and programs to restore, protect, manage and preserve conservation areas, including forested areas, agricultural lands, wildlife habitat and corridors, wetlands, watersheds, and groundwater recharge areas, that remove and sequester carbon from the atmosphere. **MM-BIO/OS55: Conservation Area Development:** Local jurisdictions or agencies can and should establish programs and funding mechanisms to create protected conservation areas, including: • Imposing mitigation fees for development on lands that would otherwise be conservation areas, and use the funds generated to protect other areas from development; • Proposing for voter approval a small tax increment (e.g., a quarter cent sales tax, perhaps for a finite time period that could be renewed) to fund the purchase of development rights in conservation areas, or purchase of the land outright. **MM-BIO/OS56: Conservation Area Preservation:** Local jurisdictions or agencies can and should establish policies to preserve existing conservation areas, and to discourage development in those areas. **MM-BIO/OS57:** Local jurisdictions or agencies can and should manage its stock of vegetation to reduce GHG emissions. **MM-BIO/OS58:** Local jurisdictions can and should conduct a comprehensive inventory and analysis of the urban forest, and coordinate tree maintenance responsibilities with all responsible departments, consistent with best management practices. **MM-BIO/OS59:** Local jurisdictions or agencies can and should evaluate existing landscaping and options to convert reflective and impervious surfaces to landscaping, and install or replace vegetation with drought-tolerant, low-maintenance native species or edible landscaping that can also provide shade and reduce heat-island effects.	
CULTURAL RESOURCES		
Potential to cause a substantial adverse change in the significance of a historical resource.	**MM-CUL1:** As part of the appropriate project/environmental review of individual projects, project sponsors can and should identify potential impacts to historic resources. A record search at the appropriate Information Center should be conducted to determine whether the project area has been previously surveyed and whether historic resources were identified. **MM-CUL2:** If indicated as necessary by a records search, prior to construction activities, project sponsors can and should obtain a qualified architectural historian to conduct historic architectural surveys as recommended by the Information Center. In the event the records indicate that no previous survey has been conducted, the Information Center will make a recommendation on whether a survey is warranted based on the sensitivity of the project area for historical resources within 1,000 feet of the project. **MM-CUL3:** Project sponsors can and should comply with Section 106 of the National Historic Preservation Act (NHPA) including,	Significant and Unavoidable

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Impact	Mitigation Measures	Significance After Mitigation
	but not limited to, projects for which federal funding or approval is required for the individual project. This law requires federal agencies to evaluate the impact of their actions on resources included in or eligible for listing in the National Register. Federal agencies must coordinate with the State Historic Preservation Officer in evaluating impacts and developing mitigation. These mitigation measures may include, but are not limited to the following: • Where appropriate, project sponsors should employ design measures to avoid historical resources and undertake adaptive reuse where appropriate and feasible. If resources are to be preserved, as feasible, project sponsors should carry out the maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation or reconstruction in a manner consistent with the Secretary of the Interior's Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings. If resources would be impacted, impacts should be minimized to the extent feasible. • Where feasible, noise buffers/walls and/or visual buffers/landscaping should be constructed to preserve the contextual setting of significant built resources. **MM-CUL4:** Project sponsors can and should secure a qualified environmental agency and/or architectural historian, or other such qualified person to document any significant historical resource(s), by way of historic narrative, photographs, and architectural drawings, as mitigation for the effects of demolition of a resource. However, such documentation will not mitigate the effects to less than significant.	
Potential to cause a substantial adverse change in the significance of an archaeological resource.	**MM-CUL5:** As part of the appropriate project/environmental review of individual projects, project sponsors can and should consult with the Native American Heritage Commission (NAHC) to determine whether known sacred sites are in the project area, and identify the Native American(s) to contact to obtain information about the project site. **MM-CUL6:** Prior to construction activities, project sponsors can and should obtain a qualified archaeologist to conduct a record search at the appropriate Information Center of the California Archaeological Inventory to determine whether the project area has been previously surveyed and whether resources were identified. **MM-CUL7:** Prior to construction activities, project sponsors can and should obtain a qualified archaeologist or architectural historian (depending on applicability) to conduct archaeological and/or historic architectural surveys as recommended by the Information Center. In the event the records indicate that no previous survey has been conducted, the Information Center will make a recommendation on whether a survey is warranted based on the sensitivity of the project area for archaeological resources. **MM-CUL8:** If the record search indicates that the project is located in an area rich with cultural materials, project sponsors can and should retain a qualified archaeologist to monitor any subsurface operations, including but not limited to grading, excavation, trenching, or removal of existing features of the subject property. **MM-CUL9:** Construction activities and excavation can and should be conducted to avoid cultural resources (if identified). If avoidance is not feasible, further work may be needed to determine the importance of a resource. Project sponsors shall obtain a qualified archaeologist familiar with the local archaeology, and/or as appropriate, an architectural historian who should make recommendations regarding the work necessary to determine importance. If the cultural resource is determined to be important under state or federal guidelines, impacts on the cultural resource will need to be mitigated. **MM-CUL10:** Project sponsors can and should stop construction activities and excavation in the area where cultural resources are	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	found until a qualified archaeologist can determine the importance of these resources.	
Potential to directly or indirectly destroy unique paleontological resources or sites or unique geological features.	**MM-CUL11:** As part of the appropriate project/environmental review of individual projects, project sponsors can and should obtain a qualified paleontologist to identify and evaluate paleontological resources where potential impacts are considered high; the paleontologist should also conduct a field survey in these areas. **MM-CUL12:** Project sponsors can and should ensure that construction activities avoid known paleontological resources, if feasible, especially if the resources in a particular lithic unit formation have been determined through detailed investigation to be unique. **MM-CUL13:** Project sponsors can and should ensure that when a construction activity could significantly disturb soils or geologic formations in areas identified as having a moderate to high potential to support paleontological resources, a qualified researcher must be stationed on-site to observe during excavation operations and recover scientifically valuable specimens. As part of this mitigation, the following actions should be taken: • A certified paleontologist should be retained (or required to be retained) by the project sponsor prior to construction to establish procedures for surveillance and the preconstruction salvage of exposed resources if fossil-bearing sediments have the potential to be impacted. • The paleontologist should provide preconstruction coordination with contractors, oversee original cutting in previously undisturbed areas of sensitive formations, halt or redirect construction activities as appropriate to allow recovery of newly discovered fossil remains, and oversee fossil salvage operations and reporting. • This measure should be placed as a condition on all plans where excavation and earthmoving activity is proposed in a geologic unit having a moderate or high potential for containing fossils. • Excavations of paleontological resources should be overseen by the qualified paleontologist and the paleontological resources given to a local agency, or other applicable institution, where they could be displayed or used for research. **MM-CUL14:** Where practicable, project sponsors can and should avoid routes and project designs that would permanently alter unique features with archaeological and/or paleontological significance.	Significant and Unavoidable
Construction and implementation of projects from the 2012-2035 RTP/SCS could disturb human remains, including those interred outside of formal cemeteries.	**MM-CUL15:** As part of project oversight of individual projects, project sponsors can and should, in the event of discovery or recognition of any human remains during construction or excavation activities associated with the project, in any location other than a dedicated cemetery, should cease further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the coroner of the county in which the remains are discovered has been informed and has determined that no investigation of the cause of death is required. **MM-CUL16:** If any discovered remains are of Native American origin: • The coroner shall contact the Native American Heritage Commission in order to ascertain the proper descendants from the deceased individual. The coroner should make a recommendation to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods. This may include obtaining a qualified archaeologist or team of archaeologists to properly excavate the human remains; or	Significant and Unavoidable

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Impact	Mitigation Measures	Significance After Mitigation
	• If the Native American Heritage Commission is unable to identify a descendant, or the descendant failed to make a recommendation within 24 hours after being notified by the commission, the landowner or their authorized representative can and should obtain a Native American monitor, and an archaeologist, if recommended by the Native American monitor, and rebury the Native American human remains and any associated grave goods, with appropriate dignity, on the property and in a location that is not subject to further subsurface disturbance where the following conditions occur: o The Native American Heritage Commission is unable to identify a descendent; o The descendant identified fails to make a recommendation; or o The landowner or their authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.	
Potential to contribute to a cumulatively considerable loss of cultural resources.	**MM-CUL17:** Impacts to cultural resources shall be minimized through cooperation, information sharing, and SCAG's ongoing regional planning efforts such as web-based planning tools for local government including CA Lots, and direct technical assistance efforts such as Compass Blueprint's Toolbox Tuesday series. Resource agencies, such as the Office of Historic Preservation, shall be consulted during this process.	Significant and Unavoidable
GEOLOGY, SOILS, AND MINERAL RESOURCES		
Implementation of the 2012 RTP/SCS could expose people or structures to potential substantial adverse effects including risk of surface rupture, ground shaking, liquefaction, landsliding or other seismically-induced hazards such as tsunami and seiche waves.	**MM-GEO1:** Project sponsors can and should ensure that projects located within or across Alquist-Priolo Zones comply with design requirements provided in Special Publication 117, published by the California Geological Survey, as well as relevant local, regional, State, and federal design criteria for construction in seismic areas. **MM-GEO2:** Project sponsors can and should ensure that projects are designed in accordance with county and city code requirements for seismic ground shaking. The design of projects should consider seismicity of the site, soil response at the site, and dynamic characteristics of the structure, in compliance with the appropriate California Building Code and State of California design standards for construction in or near fault zones, as well as all standard design, grading, and construction practices in order to avoid or reduce geologic hazards. **MM-GEO3:** Project sponsors can and should ensure that site-specific geotechnical investigations conducted by a qualified geotechnical expert should be required prior to preparation of project designs. These investigations would identify areas of potential failure and recommend remedial geotechnical measures to eliminate any problems.	Significant and Unavoidable
Significant earthwork associated with implementation of the 2012-2035 RTP/SCS could result in substantial soil erosion and/or the loss of topsoil in some	**MM-GEO4:** Project sponsors can and should ensure that site-specific geotechnical investigations conducted by a qualified geotechnical expert are conducted to ascertain soil types and local faulting prior to preparation of project designs. These investigations would identify areas of potential failure and recommend remedial geotechnical measures to eliminate any problems. **MM-GEO5:** Project sponsors can and should ensure that project designs provide adequate slope drainage and appropriate landscaping to minimize the occurrence of slope instability and erosion. Design features should include measures to reduce erosion caused by stormwater. Road cuts should be designed to maximize the potential for revegetation.	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
cases potentially resulting in slope failure.	**MM-GEO6:** Project sponsors can and should ensure that, prior to preparing project designs, new and abandoned wells are identified within construction areas to ensure the stability of nearby soils.	
Potential to be located on expansive soils, a geologic unit or soil that is unstable, or that would become unstable as a result of the Plan, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.	**MM-GEO7:** Project sponsors can and should ensure that projects avoid geologic units or soils that are unstable, expansive soils and soils prone to lateral spreading, subsidence, liquefaction, or collapse wherever feasible. **MM-GEO8:** Project sponsors can and should ensure that projects avoid landslide areas and potentially unstable slopes wherever feasible. **MM-GEO9:** Project sponsors can and should ensure that site-specific geotechnical investigations conducted by a qualified geotechnical expert should be required prior to preparation of project designs to identify the potential for subsidence and expansive soils. These investigations would identify areas of potential failure and recommend remedial geotechnical measures to eliminate any problems. Recommended corrective measures, such as structural reinforcement and replacing soil with engineered fill, should be implemented in project designs. **MM-GEO10:** SCAG shall minimize future impacts to geological resources through cooperation, information sharing, and regional program development as part of SCAG's ongoing regional planning efforts, such as web-based planning tools for local government including CA Lots, and direct technical assistance efforts such as Compass Blueprint's Toolbox Tuesday series. Resource agencies, such as the U.S. Geology Survey, should be consulted during this update process.	Significant and Unavoidable
Potential to result in the loss of availability of known aggregate and mineral resources that would be of value to the region and residents of the State.	**MM-GEO11:** SCAG shall coordinate with the Department of Conservation, California Geological Survey to maintain a database of 1) available resources in the SCAG region including permitted and un-permitted and 2) the anticipated 50-year demand. Based on the results of this survey SCAG should work with local agencies to develop an appropriate response to the anticipated demand, including identifying future sites that should seek permitting and working with industry experts to identify ways to encourage and increase recycling to reduce the demand for aggregate. **MM-GEO12:** Local jurisdictions can and should review availability of aggregate and mineral resources in their jurisdiction and should develop a long-range plan to meet demand.	Significant and Unavoidable
Potential to contribute to a cumulatively considerable increase in risk associated with geologic hazards and impacts to mineral resources.	**MM-GEO1** through **MM-GEO12** would address cumulative impacts.	Significant and Unavoidable.
GREENHOUSE GAS EMISSIONS		
Under the Plan, GHG emissions from	Mitigation measures under Air Quality, Land Use and Transportation would also reduce GHGs. **MM-GHG1:** SCAG shall update any future Regional Transportation Plans/Sustainable Community Plans and Regional	Significant and

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
residential and commercial building construction and operational energy demand and total mobile source emissions would increase (from 141 million metric tons) when compared to existing conditions (130 million metric tons). Therefore, the Plan would result in a significant impact related to total emissions.	Comprehensive Plans to incorporate policies and measures that lead to reduced greenhouse gas (GHG) emissions. Such policies and measures may be derived from the General Plans, local jurisdictions' Climate Action Plans (CAPs), and other adopted policies and plans of its member agencies that include GHG mitigation and adaptation measures or other sources. **MM-GHG2:** SCAG shall, through its ongoing outreach and technical assistance programs, work with and encourage local governments to adopt policies and develop practices that lead to GHG emission reductions. These activities will include, but are not limited to, providing technical assistance and information sharing on developing local Climate Action Plans **MM-GHG3:** SCAG shall work with the business community, including the Southern California Leadership Council and the Global Land Use and Environment Council, to develop regional economic strategies that promote energy savings and GHG emission reduction. **MM-GHG4:** SCAG shall develop statewide strategies and approaches to reducing GHG emissions and implement SB 375 through its ongoing coordination effort with other MPOs. **MM-GHG5:** SCAG shall assist ARB and air districts in efforts to implement the AB 32 Scoping Plan. **MM-GHG6:** SCAG shall develop a regional climate and economic development strategy that assesses the cost effectiveness of GHG reduction measures and prioritizes strategies that have greatest overall benefit to the economy. **MM-GHG7:** SCAG, in its capacity as a Clean Cities Coalition, shall work with member local governments to promote the use of alternative fuel technology. **MM-GHG8:** SCAG shall work with utilities, sub-regions, and other stakeholders to promote accelerated penetration of zero emission electric vehicles in the region, including developing a strategy for the deployment of public charging infrastructure. **MM-GHG9:** SCAG member cities and the county governments can and should adopt and implement Climate Actions Plans (CAPS, also known as Plans for the Reduction of Greenhouse Gas Emissions as described in CEQA Guidelines Section 15183.5 Tiering and Streamlining the Analysis of Greenhouse Gas Emissions) that contain the following information: a) Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within their respective jurisdictions; b) Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable; c) Identify and analyze the GHG emissions resulting for specific actions or categories of actions anticipated within their respective jurisdictions; d) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level; e) Establish a mechanism to monitor the plan's progress toward achieving that level and to require amendment if the plan is not achieving specified levels; and f) Be adopted in a public process following environmental review.	Unavoidable

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Impact	Mitigation Measures	Significance After Mitigation
	CAPs can and should, when appropriate, incorporate planning and land use measures from the California Attorney General's latest list of example policies to address climate change at both the plan and project level. Specifically, at the plan level, land use plans can and should, when appropriate, incorporate planning and land use measures from the California Attorney General's latest list of example policies to address climate change (http://ag.ca.gov/globalwarming/pdf/ GP_policies.pdf), including, but not limited to policies from that web page such as: • Smart growth, jobs/housing balance, transit-oriented development, and infill development through land use designations, incentives and fees, zoning, and public-private partnerships • Create transit, bicycle, and pedestrian connections through planning, funding, development requirements, incentives and regional cooperation, and create disincentives for auto use • Energy and water-efficient buildings and landscaping through ordinances, development fees, incentives, project timing, prioritization, and other implementing tools In addition, member cities and the county governments can and should incorporate, as appropriate, policies to encourage implementation of the Attorney General's list of project specific mitigation measures available at the following web site: http://ag.ca.gov/globalwarming/pdf/GW_mitigation_ measures.pdf, including, but not limited to measures from the web page such as: • Adopt a comprehensive parking policy that discourages private vehicle use and encourages the use of alternative transportation • Build or fund a major transit stop within or near development • Provide public transit incentives such as free or low-cost monthly transit passes to employees, or free ride areas to residents and customers • Incorporate bicycle lanes, routes and facilities into street systems, new subdivisions, and large developments • Require amenities for non-motorized transportation, such as secure and convenient bicycle parking. They should also incorporate, when appropriate, planning and land use measures from additional resources listed by the California Attorney General at the following webpage: http://ag.ca.gov/ globalwarming/ceqa/resources.php. In addition, CAPs can and should also incorporate analysis of climate change adaptation, in recognition of the likely and potential effects of climate change in the future regardless of the level of mitigation and in conjunction with Executive Order S-13-08, which seeks to enhance the State's management of climate impacts including sea level rise, increased temperatures, shifting precipitation, and extreme weather events by facilitating the development of State's first climate adaptation strategy. **MM-GHG10:** Project sponsors can and should require Best Available Control Technology (BACT) during construction and operation of projects, including: a) Solicit bids that include use of energy and fuel efficient fleets; b) Solicit preference construction bids that use BACT; c) Employ use of alternative fueled vehicles; d) Use lighting systems that are energy efficient, such as LED technology; e) Use CEQA Guidelines Appendix F, Energy Conservation, to create an energy conservation plan; f) Streamline permitting process to infill, redevelopment, and energy-efficient projects; g) Use an adopted emissions calculator to estimate construction-related emissions;	

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Impact	Mitigation Measures	Significance After Mitigation
	h) Use the minimum feasible amount of GHG-emitting construction materials that is feasible; i) Use of cement blended with the maximum feasible amount of flash or other materials that reduce GHG emissions from cement production; j) Use of lighter-colored pavement where feasible; k) Recycle construction debris to maximum extent feasible; and l) Plant shade trees in or near construction projects where feasible. **MM-GHG11:** SCAG shall in its capacity as a Clean Cities Coalition, and local jurisdictions can and should establish a coordinated, creative public outreach campaign, including publicizing the importance of reducing GHG emissions and steps community members can take to reduce their individual impacts. **MM-GHG12:** Pedestrian and Bicycle Promotion: SCAG shall and local jurisdictions can and should work with local community groups and downtown business associations to organize and publicize walking tours and bicycle events, and to encourage pedestrian and bicycle modes of transportation. **MM-GHG13:** Waste Reduction: Local jurisdictions can and should organize workshops on waste reduction activities for the home or business, such as backyard composting, or office paper recycling, and will schedule recycling drop-off events and neighborhood chipping/mulching days. **MM-GHG14:** Water Conservation: SCAG shall and local jurisdictions can and should organize workshops on water conservation activities, such as selecting and planting drought tolerant, native plants in landscaping, and installing advanced irrigation systems. **MM-GHG15:** Energy Efficiency: SCAG shall and local jurisdictions can and should organize workshops on steps to increase energy efficiency in the home or business, such as weatherizing the home or building envelope, installing smart lighting systems, and how to conduct a self-audit for energy use and efficiency. **MM-GHG11:** Climate Protection Summit/Fair: SCAG shall and local jurisdictions can and should organize an annual Climate Protection Summit or Fair, to educate the public on current climate science, projected local impacts, and local efforts and opportunities to reduce GHG emissions, including exhibits of the latest technology and products for conservation and efficiency. **MM-GHG12:** Schools Programs: SCAG shall and local jurisdictions can and should develop and implement a program to present information to school children about climate change and ways to reduce GHG emissions, and will support school-based programs for GHG reduction, such as school based trip reduction and the importance of recycling.	
Regarding the AB 32 GHG emission reduction targets (based on mobile sources and residential and commercial building energy use) the Plan	See Mitigation Measures **MM-GHG1** through **MM-GHG12**.	Significant and Unavoidable

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Impact	Mitigation Measures	Significance After Mitigation
would meet the applicable AB 32 reduction targets (identified in SB 375) with respect to light duty vehicles. However, without technical details as to how each sector of the economy will comply with AB 32, growth anticipated to occur under the Plan could result in a significant impact related to AB 32 and the Scoping Plan.		
Per capita CO2 emissions from light duty trucks and autos would meet the ARB 8 percent less than 2005 in 2020 target and would achieve even greater emission reductions in 2035 as compared to the 13 percent less than 2035 target (the region would achieve 16 percent per capita emission reductions in 2035). Therefore, the Plan would result in a less-than-significant impact related to per capita emissions and SB 375.	No mitigation measures were necessary as the project impact would be less than significant.	Less Than Significant

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
HAZARDOUS MATERIALS		
Potential to create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	**MM-HM1:** SCAG shall encourage the United States Department of Transportation (USDOT), the Office of Emergency Services, and California Department of Transportation (Caltrans) and the private sector to continue to conduct driver safety training programs. **MM-HM2:** SCAG shall encourage the USDOT and the California Highway Patrol to continue to enforce speed limits and existing regulations governing goods movement and hazardous materials transportation. **MM-HM3:** Project sponsors can and should comply with all applicable laws, regulations, and health and safety standards set forth by federal, state, and local authorities that regulate the proper handling of such materials and their containers to the routine transport, use, and disposal of hazardous materials does not create a significant hazard to the public or the environment.	Significant and Unavoidable
Potential to create a hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment during transportation.	**MM-HM3** above would address this impact.	Significant and Unavoidable
Potential to create a hazard to the public or the environment by emitting hazardous materials within one-quarter mile of a school.	**MM-HM4:** Project sponsors can and should consider any known or planned school locations when determining the alignment of new transportation projects and modifications to existing transportation facilities as well as any industrial or other use that could pose a hazard to students.	Significant and Unavoidable
Potential to create a hazard to the public or the environment through the disturbance of contaminated property during the construction of new	**MM-HM1** through **MMHM4** above would also address this impact. **MM-HM5:** Project sponsors can and should ensure that Best Management Practices (BMPs) are implemented as part of construction to minimize the potential negative effects to groundwater and soils. These should include the following: • Follow manufacturer's recommendations on use, storage, and disposal of chemical products used in construction; • Avoid overtopping construction equipment fuel gas tanks; • During routine maintenance of construction equipment, properly contain and remove grease and oils; • Properly dispose of discarded containers of fuels and other chemicals;	Less Than Significant

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
transportation or expansion of existing transportation facilities and the disturbance of contaminated sites as a result of population, housing and employment growth in the region.	• Ensure that construction would not have a significant impact on the environment or pose a substantial health risk to construction workers and the occupants of the proposed development. Soil sampling and chemical analyses of samples should be performed to determine the extent of potential contamination beneath all UST's, elevator shafts, clarifiers, and subsurface hydraulic lifts when on-site demolition, or construction activities would potentially affect a particular development or building; and • If soil, groundwater or other environmental medium with suspected contamination is encountered unexpectedly during construction activities (e.g., identified by odor or visual staining, or if any underground storage tanks, abandoned drums or other hazardous materials or wastes are encountered), the project sponsor should cease work in the vicinity of the suspect material, the area should be secured as necessary, and the project sponsor should take all appropriate measures to protect human health and the environment. Appropriate measures should include notification of regulatory agency(ies) and implementation of actions as necessary, to identify the nature and extent of contamination. Work should not resume in the area(s) affected until the measures have been implemented under the oversight of the City or regulatory agency, as appropriate. **MM-HM6:** As appropriate, project sponsors can and should submit documentation to determine whether radon or vapor intrusion from the groundwater and soil is located on-site as part of the Phase I documents. The Phase I analysis should be submitted to the appropriate government agency for review and approval, along with a Phase II report if warranted by the Phase I report for the project site. The reports should make recommendations for remedial action, if appropriate, and should be signed by a Registered Environmental Assessor, Professional Geologist, or Professional Engineer. The project sponsor should implement the approved recommendations. **MM-HM7:** As appropriate each project sponsor can and should submit a Hazardous Materials Business/Operations Plan for review and approval by the appropriate local agency. Once approved this plan should be kept on file with the Lead Agency (or other appropriate government agency) and will be updated as applicable. The purpose of the Hazardous Materials Business/Operations Plan is to ensure that employees are adequately trained to handle the materials and provides information to the local fire protection agency should emergency response be required. The Hazardous Materials Business/Operations Plan should include the following: • The types of hazardous materials or chemicals stored and/or used on-site, such as petroleum fuel products, lubricants, solvents, and cleaning fluids • The location of such hazardous materials • An emergency response plan including employee training information • A plan that describes the manner in which these materials are handled, transported and disposed **MM-HM8:** Project sponsors can and should implement all of the following Best Management Practices (BMPs) regarding potential soil and groundwater hazards. • Soil generated by construction activities should be stockpiled on-site in a secure and safe manner. All contaminated soils determined to be hazardous or non-hazardous waste must be adequately profiled (sampled) prior to acceptable reuse or disposal at an appropriate off-site facility. Specific sampling and handling and transport procedures for reuse or disposal should be in accordance with applicable local, State and federal agencies laws. • Groundwater pumped from the subsurface should be contained onsite in a secure and safe manner, prior to treatment and disposal, to ensure environmental and health issues are resolved pursuant to applicable laws and policies. Engineering controls should be utilized, which include impermeable barriers to prohibit groundwater and	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	vapor intrusion into the building. • Prior to issuance of any demolition, grading, or building permit, the sponsor should submit for review and approval by the Lead Agency (or other appropriate government agency), written verification that the appropriate federal, State and/or local oversight authorities, including, but not limited to the Regional Water Quality Control Board (RWQCB), have granted all required clearances and confirmed that the all applicable standards, regulations and conditions for all previous contamination at the site. **MM-HM9:** Project sponsors can and should consult all known databases of contaminated sites and undertake a standard Phase I Environmental Site Assessment in the process of planning, environmental clearance, and construction for projects included in the 2012-2035 RTP/SCS, including development projects. **MM-HM10:** Where contaminated sites are identified, project sponsors can and should develop appropriate mitigation measures to assure that worker and public exposure is minimized to an acceptable level and to prevent any further environmental contamination as a result of construction. **MM-HM11:** If asbestos-containing materials (ACM) are found to be present in building materials to be removed project sponsors can and should submit specifications signed by a certified asbestos consultant for the removal, encapsulation, or enclosure of the identified ACM in accordance with all applicable laws and regulations, including but not necessarily limited to: California Code of Regulations, Title 8; Business and Professions Code; Division 3; California Health & Safety Code Section 25915-25919.7; and other local regulations as applicable. **MM-HM12:** Prior to issuance of demolition, grading, or building permits, project sponsors can and should submit to the appropriate agency responsible for hazardous materials/wastes oversight, a Phase II Environmental Site Assessment report if warranted by a Phase I report for the project site. The reports should make recommendations for remedial action, if appropriate, and should be signed by a Registered Environmental Assessor, Professional Geologist, or Professional Engineer. **MM-HM13:** Project sponsors can and should submit a comprehensive assessment report to the appropriate agency, signed by a qualified environmental professional, documenting the presence or lack thereof of ACM, lead-based paint, and any other building materials or stored materials classified as hazardous waste by State or federal law. **MM-HM14:** If a Phase II Environmental Site Assessment report recommends remedial action, the project sponsor can and should: • Consult with the appropriate local, State, and federal environmental regulatory agencies to ensure sufficient minimization of risk to human health and environmental resources, both during and after construction, posed by soil contamination, groundwater contamination, or other surface hazards including, but not limited to, underground storage tanks, fuel distribution lines, waste pits and sumps; • Obtain and submit written evidence of approval for any remedial action if required by a local, State, or federal environmental regulatory agency; and • Submit a copy of all applicable documentation required by local, State, and federal environmental regulatory agencies, including but not limited to: permit applications, Phase I and II environmental site assessments, human health and ecological risk assessments, remedial action plans, risk management plans, soil management plans, and groundwater management plans.	

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Impact	Mitigation Measures	Significance After Mitigation
	MM-HM15: If lead-based paint is present, project sponsors can and should submit specifications to the appropriate agency, signed by a certified Lead Supervisor, Project Monitor, or Project Designer for the stabilization and/or removal of the identified lead paint in accordance with all applicable laws and regulations, including but not necessarily limited to: California Occupational Safety and Health Administration's (Cal OSHA's) Construction Lead Standard, Title 8 California Code of Regulations (CCR) Section 1532.1 and Department of Health Services (DHS) Regulation 17 CCR Sections 35001-36100, as may be amended. If other materials classified as hazardous waste by State or federal law are present, the project sponsor should submit written confirmation to the appropriate local agency that all State and federal laws and regulations should be followed when profiling, handling, treating, transporting and/or disposing of such materials. **MM-HM16:** If materials classified as hazardous waste by State or federal law are present, project sponsors can and should submit written confirmation to appropriate local agency that all State and federal laws and regulations should be followed when profiling, handling, treating, transporting and/or disposing of such materials	
Potential to contribute a cumulatively significant increase in risk associated with hazardous materials transport outside of the SCAG region.	**MM-HM1** through **MM-HM4** would address this impact.	Significant and Unavoidable
LAND USE AND AGRICULTURE RESOURCES		
Potential to result in inconsistencies with currently applicable adopted local land use plans and policies.	**MM-LU1:** SCAG shall encourage cities and counties in the region to provide SCAG with electronic versions of their most recent general plan (and associated environmental document) and any updates as they are produced. **MM-LU2:** SCAG shall encourage, through regional policy comments, that cities and counties update their general plans at least every ten years, as recommended by the Governor's Office of Planning and Research. **MM-LU3:** SCAG shall work with its member cities and counties to ensure that transportation projects and growth are consistent with the RTP and general plans. **MM-LU4:** SCAG shall coordinate with member cities and counties to encourage that general plans reflect RTP/SCS policies and strategies. SCAG will work to build consensus on how to address inconsistencies between general plans and RTP/SCS policies. **MM-LU5:** SCAG shall provide technical assistance and regional leadership to implement the RTP/SCS goals and strategies and integrate growth and land use planning with the existing and planned transportation network. **MM-LU6:** SCAG shall provide planning services to local jurisdictions through Compass Blueprint Demonstration Projects. These projects will help local jurisdictions: • Update General Plans to reflect Compass Blueprint principles and integrate land use and transportation planning. • Develop specific plans, zoning overlays and other planning tools to enable and stimulate desired land use changes that are consistent with the future land development pattern in the 2012-2035 RTP/SCS	Significant and Unavoidable

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Impact	Mitigation Measures	Significance After Mitigation
	• Complete the economic analysis and community involvement efforts that will ensure that the planned changes are market feasible and responsible to stakeholder concerns. • Visualize potential changes, through innovative graphics and mapping technology to inform the dialogue about growth, development and transportation at the local and regional level. **MM-LU7:** SCAG shall continue with a targeted public relations strategy that emphasizes regional leadership, the benefits and implications of Compass Blueprint principles and sustainable growth, and builds a sense of common interests among Southern Californians. **MM-LU8:** SCAG shall use its Intergovernmental Review Process to provide review and comment on large development projects regarding their consistency with the RTP and other regional planning efforts. **MM-LU9:** SCAG shall develop and implement coordinated mitigation programs for regional projects, with an emphasis on regional transportation projects. **MM-LU10:** Local jurisdictions can and should provide for new housing consistent with the regional Housing Needs Assessment (RHNA) to accommodate their share of the forecasted regional growth.	
Potential to disrupt or divide established communities.	**MM-LU11:** Significant adverse impacts to community cohesion resulting from the displacement of residences or businesses can and should be mitigated with specific relocation measures as dictated by local, state or federal requirements on a project-by project basis. Such measures include assistance in finding a new location, assistance with moving, or compensation for losses. Where it has been determined that displacement is necessary and displaced individuals are eligible, a relocation assistance program consistent with the State Uniform Location Assistance and Real Properties Acquisition Policies Act provides compensation and assistance in finding new residence for displaced individuals. **MM-LU12:** Project sponsors can and should design new transportation facilities that consider access to existing community facilities. During the design phase of the project, community amenities and facilities can and should be identified and considered in the design of the project. **MM-LU13:** Project sponsors can and should design roadway improvements that minimize barriers to pedestrians and bicyclists. During the design phase, pedestrian and bicycle routes should be determined that permit connections to nearby community facilities.	Significant and Unavoidable
Potential to result in substantial disturbance and/or loss of forestlands, prime farmlands and/or grazing lands, throughout the six-county SCAG region.	**MM-LU14:** For projects that require approval or funding by the USDOT, project sponsors can and should comply with Section 4(f) U.S. Department of Transportation Act of 1966 (USDOT Act). **MM-LU15:** Project sponsors can and should ensure that at least one acre of unprotected open space is permanently conserved for each acre of open space developed as a result of transportation projects/improvements. **MM-LU16:** Local jurisdictions can and should seek funding to prepare specific plans and related environmental documents to facilitate mixed-use development at selected sites, and to allow these areas to serve as receiver sites for transfer of development rights away from environmentally sensitive lands and rural areas outside established urban growth boundaries. **MM-LU17:** Local jurisdictions can and should preserve and create open space and parks. Preserve existing trees, and plant	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	replacement trees at a set ratio. **MM-LU18:** Project sponsors can and should consider corridor realignment, buffer zones and setbacks, and berms and fencing where feasible, to avoid agricultural lands and to reduce conflicts between transportation uses and agricultural lands. **MM-LU19:** Prior to final approval of each project and when feasible and prudent, the project sponsor can and should establish conservation easement programs to mitigate impacts to prime farmland. **MM-LU20:** Prior to final approval of each project, the project sponsor can and should to the extent practical and feasible, avoid impacts to prime farmlands or farmlands that support crops considered valuable to the local or regional economy. **MM-LU21:** SCAG shall use its intergovernmental review (IGR) process to review projects with potentially significant impacts to important farmlands and recommend impact avoidance and mitigation measures. **MM-LU22:** SCAG shall work with member agencies and the region's farmland interests to develop regional guidelines for buffering farmland from urban encroachment, resolving conflicts that prevent farming on hillsides and other designated areas, and closing loopholes that allow conversion of non-farm uses without a grading permit. **MM-LU23:** Local jurisdictions can and should establish programs to direct growth to less agriculturally valuable lands and ensure, where possible, the continued protection of the most agriculturally valuable land within each county. The following are offered as examples of programs: • The development or participation in transfer of development rights programs to encourage the preservation of agricultural lands. • Tools for the preservation of agricultural lands such as eliminating estates and ranchettes and clustering to retain productive agricultural land. • Easing restrictions on farmer's markets and encourage cooperative farming initiatives to increase the availability of locally grown food. • Considering partnering with school districts to develop farm-to-school programs. **MM-LU24:** Local jurisdictions can and should avoid the premature conversion of farmlands by promoting infill development and the continuation of agricultural uses until urban development is imminent; if development of agricultural lands is necessary, growth can and should be directed to those lands on which the continued viability of agricultural production has been compromised by surrounding urban development on the loss of local markets. **MM-LU25:** Local jurisdictions can and should encourage patterns of urban development and land use, which reduce costs on infrastructure and make better use of existing facilities. Strategies local jurisdictions can and should pursue include: • Increase the accessibility to natural areas lands for outdoor recreation. • Promote infill development and redevelopment to revitalize existing communities • Utilize "green" development techniques • Promote water-efficient land use and development. **MM-LU26:** Project sponsors and local jurisdictions can and should promote infill development and redevelopment to encourage the efficient use of land and minimize the development of agricultural and open space lands. **MM-LU27:** Local jurisdictions can and should consider the following land use principles that use resources efficiently, and to the	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	extent practical and feasible minimize pollution and reduce waste generation: • Mixed-use residential and commercial development that is connected with public transportation and utilizes existing infrastructure. • Land use and planning strategies to increase biking and walking trips. **MM-LU28:** Individual projects must be consistent with federal, state, and local policies that preserve agricultural lands and support the economic viability of agricultural activities, as well as policies that provide compensation for property owners if preservation is not feasible. **MM-LU29:** For projects in agricultural areas, project sponsors can and should contact the California Department of Conservation and each county's Agricultural Commissioner's office to identify the location of prime farmlands and lands that support crops considered valuable to the local or regional economy. Impacts to such lands can and should be evaluated in project-specific environmental documents. The analysis can and should use the land evaluation and site assessment (LESA) analysis method (CEQA Guidelines §21095), as appropriate. The project sponsors or local jurisdictions can and should be responsible for ensuring adherence to the mitigation measures prior to construction. Mitigation measures may include conservation easements or the payment of in-lieu fees. **MM-LU30:** For those projects that require federal funding, the federal agency evaluates the effects of the action to agricultural resources using the criteria set forth in the Farmland Protection Policy Act (FPPA). The FPPA is administered by the NRCS, which determines impacts to farmland that could occur due to the proposed project. The determination is made through coordination between the federal agency proposing or supporting the project and NRCS. The assessment of potential impacts to farmland from corridor type projects, which is typical of transportation projects analyzed in this PEIR, will require completion of Form NRCS-CPA-106, Farmland Conservation Impact Rating for Corridor Type Projects. NRCS will make a determination, using set thresholds, as to whether additional project specific mitigation would be required. **MM-LU31:** Prior to final approval of each project, the project sponsor can and should encourage enrollments of agricultural lands for counties that have Williamson Act programs, where applicable. **MM-LU32:** SCAG shall support policies that preserve and promote the productivity and viability of agricultural lands, including promoting the availability of locally grown and organic food in the region. **MM-LU33:** Project sponsors and local jurisdictions can and should submit for IGR review projects with potentially significant impacts to important farmlands. Projects can and should include mitigation measures to reduce impacts and demonstrate project alternatives that avoid or lessen impact to agricultural lands. Mitigation can and should occur at a **1:**1 ratio. **MM-LU34:** Preserve forested areas, agricultural lands, wildlife habitat and corridors, wetlands, watersheds, groundwater recharge areas and other open space that provide carbon sequestration benefits. **MM-LU35:** Require best management practices in agriculture and animal operations to reduce emissions, conserve energy and water, and utilize alternative energy sources, including biogas, wind and solar.	
Potential to influence the pattern of	**MM-LU36:** Local jurisdictions can and should encourage patterns of urban development and land use, which reduce costs on	Significant and

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
urbanization in the region such that land use incompatibilities could occur.	infrastructure and make better use of existing facilities. **MM-LU37:** SCAG's Compass Blueprint program and other ongoing regional planning efforts will be used to build a consensus in the region to support changes in land use to accommodate future population growth while maintaining the quality of life in the region. **MM-LU38:** Local jurisdictions can and should adopt and implement General Plan Housing Elements that accommodate the housing need identified through the RHNA process. Affordable housing can and should be provided consistent with the RHNA income category distribution adopted for each jurisdiction. **MM-LU39:** Local jurisdictions can and should consider shared regional priorities, as outlined in the Compass Blueprint, 2012-2035 RTP/SCS and other ongoing regional planning efforts, in determining their own development goals and drafting local plans. **MM-LU40:** Local jurisdictions and subregional organizations can and should encourage the cleanup and redevelopment of brownfield sites. **MM-LU41:** Local jurisdictions or agencies can and should adopt and implement a development pattern that utilizes existing infrastructure; reduces the need for new roads, utilities and other public works in new growth areas; and enhances non-automobile transportation. **MM-LU42:** Local jurisdictions or agencies can and should establish an urban growth boundary (UBG) with related ordinances or programs to limit suburban sprawl; local jurisdictions or agencies can and should restrict urban development beyond the UGB and streamline entitlement processes within the UGB for consistent projects. **MM-LU43:** Urban development can and should occur only where urban public facilities and services exist or can be reasonably made available. **MM-LU44:** The improvement and expansion of one urban public facility or service can and should not stimulate development that significantly precedes the local jurisdiction's ability to provide all other necessary urban public facilities and services at adequate levels. **MM-LU45:** Local jurisdictions can and should redirect new growth into existing city/urban reserve areas. **MM-LU46:** Local jurisdictions can and should maintain a one dwelling unit per 10-acre minimum lot size or lower density in areas outside designated urban service lines. **MM-LU47:** Local jurisdictions can and should encourage high-density, mixed-use, infill development and creative reuse of brownfield, under-utilized and/or defunct properties within the urban core. **MM-LU48:** Local jurisdictions can and should increase densities in urban core areas to support public transit. **MM-LU49:** Local jurisdictions can and should remove barriers to the development of accessory dwelling units in existing residential neighborhoods as appropriate **MM-LU50:** Local jurisdictions can and should reduce required road width standards wherever feasible to calm traffic and encourage alternative modes of transportation.	Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	MM-LU51: Local jurisdictions can and should reduce parking space requirements, unbundle parking from rents and charge for parking in new developments. **MM-LU52:** Local jurisdictions can and should add bicycle facilities to streets and public spaces. **MM-LU53:** SCAG shall promote infill, mixed-use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones. **MM-LU54:** Local jurisdictions can and should plan for and create incentives for mixed-use development. **MM-LU55:** Local jurisdictions can and should identify sites suitable for mixed-use development and establish appropriate site-specific standards to accommodate the mixed uses. Site-specific standards could include: • Increasing allowable building height or allowing height limit bonuses; • Allowing flexibility in applying development standards (such as FAR2 and lot coverage) based on the location, type, and size of the units, and the design of the development; • Allowing the residential component to be additive rather than within the established FAR for that zone, and eliminating maximum density requirements for residential uses in mixed use zones; • Allowing reduced and shared parking based on the use mix, and establishing parking maximums where sites are located within 0.25 miles of a public transit stop; • Allowing for tandem parking, shared parking and off-site parking leases; • Requiring all property owners in mixed-use areas to unbundle parking from commercial and residential leases; • Creating parking benefit districts, which invest meter revenues in pedestrian infrastructure and other public amenities; • Establishing performance pricing of street parking, so that it is expensive enough to promote frequent turnover and keep 15 percent of spaces empty at all times. **MM-LU56:** Local jurisdictions can and should enable prototype mixed-use structures for use in neighborhood center zones that can be adapted to new uses over time with minimal internal remodeling. **MM-LU57:** Local jurisdictions can and should identify and facilitate the inclusion of complementary land uses not already present in local zoning districts, such as supermarkets, parks and recreational fields, schools in neighborhoods, and residential uses in business districts, to reduce the vehicle miles traveled and promote bicycling and walking to these uses. **MM-LU58:** Local jurisdictions can and should work with employers developing larger projects to ensure local housing opportunities for their employees, and engage employers to find ways to provide housing assistance as part of their employee benefits packages; major projects in mixed-use areas can and should include work-force housing where feasible. **MM-LU59:** Local jurisdictions can and should revise zoning ordinance(s) to allow local-serving businesses, such as childcare centers, restaurants, banks, family medical offices, drug stores, and other similar services near employment centers to minimize midday vehicle use. **MM-LU60:** Local jurisdictions can and should develop form-based community design standards to be applied to development projects and land use plans, using a comprehensive community outreach, for areas designated mixed-use. **MM-LU61:** Local jurisdictions can and should mix affordable housing units with market rate units as opposed to building	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	segregated affordable housing developments. **MM-LU62:** Where practical and feasible, local jurisdictions can and should develop programs that enable the reuse of underutilized commercial, office and/or industrial properties for housing or mixed-use housing. **MM-LU63:** Local jurisdictions can and should ensure consistency with "smart growth" principles – mixed-use, infill, and higher density projects that provide alternatives to individual vehicle travel and promote the efficient delivery of services and goods. **MM-LU64:** Local jurisdictions can and should meet recognized "smart growth" benchmarks. **MM-LU65:** SCAG shall educate the public about the many benefits of well-designed, higher density development. **MM-LU66:** Project sponsors can and should incorporate public transit into the project's design. **MM-LU67:** Project sponsors can and should include pedestrian and bicycle facilities within projects and ensure that existing non-motorized routes are maintained and enhanced. **MM-LU68:** Local jurisdictions can and should encourage residential development in High Quality Transit Areas (HQTAs). Such development can and should include a generally a walkable transit village that has a minimum density of 20 dwelling units per acre and is within a ½ mile of a well-serviced transit stop, and includes transit corridors with minimum 15-minute or less service frequency during peak commute hours. **MM-LU69:** Local jurisdictions can and should promote greater linkage between land uses and transit, as well as other modes of transportation. **MM-LU70:** Local jurisdictions can and should ensure new development is designed to make public transit a viable choice for residents, including: • Locating medium-high density development near activity centers that can be served efficiently by public transit and alternative transportation modes; • Locating medium-high density development near streets served by public transit whenever feasible; • Linking neighborhoods to bus stops by continuous sidewalks or pedestrian paths. **MM-LU71:** Local jurisdictions can and should establish city-centered corridors, directing development to existing transportation corridors. **MM-LU72:** Local jurisdictions can and should develop form-based community design standards to be applied to development projects and land use plans, using a comprehensive community outreach program, for areas designated mixed-use **MM-LU73:** Local jurisdictions can and should locate affordable housing in transit-oriented development whenever feasible **MM-LU74:** Local jurisdictions can and should consider jobs/housing balance, to the extent practical and feasible, and encourage the development of communities where people live closer to work, bike, walk, and take transit as a substitute for personal auto travel. **MM-LU75:** SCAG and local jurisdictions shall minimize public expenditure for infrastructure and facilities to support urban type land uses in areas where public health and safety could not be guaranteed.	

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Impact	Mitigation Measures	Significance After Mitigation
	MM-LU76: Project sponsors can and should consider community cohesion in designing projects through communities. Transit facilities should be designed to integrate with the community and encourage walking and bicycling as well as park and ride. New or widened roadways (and freeways) should be designed to minimize impacts to the extent feasible through landscaping, pedestrian furniture as appropriate. New roadways or freeways should consider feasible innovative designs such as cap parks that maintain community cohesion. **MM-LU77:** Local jurisdictions can and should promote development and preservation of neighborhood characteristics that encourage walking and bicycle riding in lieu of automobile-based travel. **MM-LU78:** Local jurisdictions can and should create and preserve distinct, identifiable neighborhoods whose characteristics support pedestrian travel, especially within, but not limited to, mixed-use and transit-oriented development areas, including: • Designing or maintaining neighborhoods where the neighborhood center can be reached in approximately five minutes of walking; • Increasing housing densities from the perimeter to the center of the neighborhood; • Directing retail, commercial, and office space to the center of the neighborhood; • Encouraging pedestrian-only streets and/or plazas within developments, and destinations that may be reached conveniently by public transportation, walking, or bicycling; • Allowing flexible parking strategies in neighborhood activity centers to foster a pedestrian-oriented streetscape; • Providing continuous sidewalks with shade trees and landscape strips to separate pedestrians from traffic; • Encouraging neighborhood parks and recreational centers near concentrations of residential areas (preferably within one quarter mile) and include pedestrian walkways and bicycle paths that encourage non-motorized travel. **MM-LU79:** Local jurisdictions can and should ensure pedestrian access to activities and services, especially within, but not limited to, mixed-use and transit-oriented development areas, including: • Ensuring new development that provides pedestrian connections in as many locations as possible to adjacent development, arterial streets, thoroughfares; • Ensuring a balanced mix of housing, workplaces, shopping, recreational opportunities, and institutional uses, including mixed-use structures; • Locating schools in neighborhoods, within safe and easy walking distances of residences served; • For new development, primary entrances shall be pedestrian entrances, with automobile entrances and parking located to the rear; • Support development where automobile access to buildings does not impede pedestrian access, by consolidating driveways between buildings or developing alley access; • Street parking provided shall be utilized as a buffer between sidewalk pedestrian traffic and the automobile portion of the roadway; • Establish pedestrian and bicycle connectivity standards for new development, with block sizes between 1 and 2 acres; • For existing areas that do not meet established connectivity standards, prioritize the physical development of pedestrian connectors;	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	• Prioritizing grade-separated bicycle / pedestrian crossings where appropriate to enhance connectivity or overcome barriers such as freeways, railways and waterways. **MM-LU80:** Local jurisdictions can and should review fee structures and other opportunities to provide financial and administrative incentives to support desired land uses, development patterns, and alternative modes of transportation. **MM-LU81:** Local jurisdictions can and should promote desired land uses by scaling developer fees based on desired criteria, for example: • Increasing or reducing fees proportionally with distance from the city center or preferred transit sites; • Increasing or reducing fees based on the degree to which mixed uses are incorporated into the project; • Reducing fees for creative re-use of brownfield sites; • Increasing fees for the use of greenfield sites. **MM-LU82:** Local jurisdictions can and should provide fast-track permitting and reductions in processing fees for desired projects. Local jurisdictions can and should research and implement a program of incentives for development projects that are fully consistent with the 2012-2035 RTP/SCS. **MM-LU83:** Local jurisdictions can and should provide incentive funding and/or infrastructure loans to support desired projects. **MM-LU84:** Local jurisdictions can and should give preference for infrastructure improvements that support or enhance desired land uses and projects. **MM-LU85:** Local jurisdictions can and should reduce heat gain from pavement and other hardscaping, including: • Reduce street rights-of-way and pavement widths to pre-World War II widths (typically 22 to 34 feet for local streets, and 30 to 35 feet for collector streets, curb to curb), unless landscape medians or parkway strips are allowed in the center of roadways; • Reinstate the use of parkway strips to allow shading of streets by trees; • Include shade trees on south- and west-facing sides of structures; • Include low-water landscaping in place of hardscaping around transportation infrastructure and in parking areas; • Install cool roofs, green roofs, and use cool paving for pathways, parking, and other roadway surfaces; • Establish standards that provide for pervious pavement options; ▪ Remove obstacles to xeriscaping, edible landscaping and low-water landscaping.	
Potential to change patterns of growth beyond the SCAG region.	See Mitigation Measures **MM-LU1** through **MM-LU87**.	Significant and Unavoidable
NOISE		
Grading and construction activities associated with the proposed freeway,	**MM-NO1:** To reduce noise impacts due to construction, project sponsors can and should require construction contractors to implement a site-specific noise reduction program, subject to the Lead Agency (or other appropriate government agency) review and approval, which includes the following measures:	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
arterial, transit, and rail projects, identified in the 2012-2035 RTP/SCS, as well as development projects anticipated by the Plan would intermittently and temporarily generate noise and vibration levels above ambient background levels. Noise and vibration levels in the immediate vicinity of the construction sites would increase substantially sometimes for extended duration. Therefore, without mitigation, the Plan would result in a significant impact related to construction noise and vibration.	• Equipment and trucks used for project construction can and should utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible). • Except as may be exempted by the Lead Agency (or other appropriate government agency), impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction can and should be hydraulically or electrically powered to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust should be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves should be used, if such jackets are commercially available and this could achieve a reduction of 5 dBA. Quieter procedures should be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures. • Stationary noise sources can and should be located as far from adjacent sensitive receptors as possible and they should be muffled and enclosed within temporary sheds, incorporate insulation barriers, or use other measures as determined by the Lead Agency (or other appropriate government agency) to provide equivalent noise reduction. **MM-NO2:** Prior to the issuance of a building permit, along with the submission of construction documents, each project sponsor can and should submit to the Lead Agency (or other government agency as appropriate) a list of measures to respond to and track complaints pertaining to construction noise. These measures should include: • A procedure and phone numbers for notifying the Lead Agency staff and local Police Department; (during regular construction hours and off-hours); • A sign posted on-site pertaining with permitted construction days and hours and complaint procedures and who to notify in the event of a problem. The sign should also include a listing of both the Lead Agency and construction contractor's telephone numbers (during regular construction hours and off-hours); • The designation of an on-site construction complaint and enforcement manager for the project; • Notification of neighbors and occupants within 300 feet of the project construction area at least 30 days in advance of extreme noise generating activities about the estimated duration of the activity; and • A preconstruction meeting can and should be held with the job inspectors and the general contractor/on-site project manager to confirm that noise measures and practices (including construction hours, neighborhood notification, posted signs, etc.) are completed. **MM-NO3:** Project sponsor can and should implement use of portable barriers in the vicinity of sensitive receptors during construction including construction of subsurface barriers, debris basins, and storm water drainage facilities. **MM-NO4:** For projects that require pile driving or other construction noise above 90 dBA in proximity to sensitive receptors, to further reduce potential pier drilling, pile driving and/or other extreme noise generating construction impacts greater than 90dBA, a set of site-specific noise attenuation measures can and should be completed under the supervision of a qualified acoustical consultant. Prior to commencing construction, a plan for such measures should be submitted for review and approval by the Lead Agency (or other appropriate government agency) to ensure that maximum feasible noise attenuation will be achieved. This plan should be based on the final design of the project. A third-party peer review, paid for by the project sponsor, may be required to assist the Lead Agency in evaluating the feasibility and effectiveness of the noise reduction plan submitted by the project sponsor. The criterion for approving the plan should be a determination that maximum feasible noise attenuation will be achieved. The noise reduction plan can and should	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	include, but not be limited to, an evaluation of implementing the following measures. These attenuation measures can and should include as many of the following control strategies as applicable to the site and construction activity: • Erect temporary plywood noise barriers around the construction site, particularly along on sites adjacent to residential buildings; • Implement "quiet" pile driving technology (such as pre-drilling of piles, the use of more than one pile driver to shorten the total pile driving duration), where feasible, in consideration of geotechnical and structural requirements and conditions; • Utilize noise control blankets on the building structure as the building is erected to reduce noise emission from the site; • Evaluate the feasibility of noise control at the receivers by temporarily improving the noise reduction capability of adjacent buildings by the use of sound blankets for example and implement such measure if such measures are feasible and would noticeably reduce noise impacts; and • Monitor the effectiveness of noise attenuation measures by taking noise measurements. **MM-NO5:** Noise generated from any rock-crushing or screening operations performed within 3,000 feet of any occupied residence can and should be mitigated by the project sponsor by strategic placement of material stockpiles between the operation and the affected dwelling or by other means approved by the local jurisdiction. **MM-NO6:** Where feasible, pile holes can and should be pre-drilled to reduce potential noise and vibration impacts. **MM-NO7:** As necessary, each project sponsor can and should retain a structural engineer or other appropriate professional to determine threshold levels of vibration and cracking that could damage any adjacent historic or other structure subject to damage, and design means and construction methods to not exceed the thresholds.	
Noise-sensitive land uses could be exposed to operational noise in excess of normally acceptable noise levels and/or could experience substantial increases in noise as a result of; a) the operation of expanded or new transportation facilities (i.e., new or increased traffic resulting from new highways, addition of highway lanes, roadways, ramps,	**MM-NO8:** Project sponsors can and should comply with all local sound control and noise level rules, regulations, and ordinances. **MM-NO9:** As part of the appropriate environmental review of each project, a project specific noise evaluation can and should be conducted and appropriate mitigation identified and implemented. **MM-NO10:** Project sponsors can and should employ, where their jurisdictional authority permits, land use planning measures, such as zoning, restrictions on development, site design, and use of buffers to ensure that future development is compatible with adjacent transportation facilities. **MM-NO11:** As a last resort, project sponsors can and should eliminate noise-sensitive receptors by acquiring freeway and rail rights-of-way. This would ensure the effective operation of all transportation modes. **MM-NO12:** Project sponsors can and should, to the extent feasible and practicable, maximize the distance between noise-sensitive land uses and new roadway lanes, roadways, rail lines, transit centers, park-and-ride lots, and other new noise-generating facilities. **MM-NO13:** Project sponsors can and should construct sound reducing barriers between noise sources and noise-sensitive land uses. Sound barriers can be in the form of earth-berms or soundwalls. Constructing roadways so as appropriate and feasible that they are depressed below-grade of the existing sensitive land uses also creates an effective barrier	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
goods movement facilities, grade separations and new transit facilities, etc.); and/or b) increased vehicle activity (autos, trucks, buses, planes, trains, etc.) from increased activity associated with development resulting in increased ambient noise next to transportation facilities. Without mitigation, the Plan would result in a significant impact related to land use compatibility.	between the roadway and sensitive receptors. **MM-NO14:** Project sponsors can and should, to the extent feasible and practicable, improve the acoustical insulation of dwelling units where setbacks and sound barriers do not sufficiently reduce noise. **MM-NO15:** The project sponsors can and should implement, to the extent feasible and practicable, speed limits and limits on hours of operation of rail and transit systems, where such limits may reduce noise impacts. **MM-NO16:** To reduce noise impacts, maximize distance of new route alignments from sensitive receptors. For example, if a transit project were constructed along the center of a freeway (as opposed to a new route or along the side of the freeway), operational noise impacts would be reduced by the increase in distance to the noise sensitive sites and the masking effects of the freeway traffic noise. **MM-NO17:** Transit-related passenger stations, central maintenance facilities, decentralized maintenance facilities, and electric substations can and should be located away from sensitive receptors to the maximum extent feasible.	
Vibration-sensitive land uses could be exposed to vibration in excess of normally acceptable levels and/or could experience substantial increases in vibration as a result of the operation of expanded or new transportation facilities. Without mitigation, the Plan would result in a significant impact related to vibration.	**MM-NO18:** Local jurisdictions or agencies can and should, as practical and feasible, adhere to published local, state and federal guidelines concerning groundborne vibration impacts.	Significant and Unavoidable
The Plan would contribute to cumulative ambient noise and vibration	See Mitigation Measures **MM-NO1** through **MM-NO18**.	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
levels in areas outside the region as a result of the operation of expanded or new transportation facilities (i.e., increased traffic resulting from new highways, addition of highway lanes, roadways, ramps, and new use of new transit and rail facilities as well as increased use of existing transit and rail facilities, etc.). Therefore, the Plan would contribute to a cumulatively considerable noise impact in these areas.		
POPULATION, HOUSING, AND EMPLOYMENT		
Potential to facilitate substantial population growth to some areas of the SCAG region.	**MM-POP1:** SCAG shall work with its member agencies to implement growth strategies to create an urban form designed to focus development in HQTAs in accordance with the policies, strategies and investments contained in the 2012-2035 RTP/SCS, enhancing mobility and reducing land consumption.	Significant and Unavoidable
Potential to require the acquisition of rights-of-way (ROW) that could displace a substantial number of existing homes and businesses.	**MM-POP2:** For projects with the potential to displace homes and/or businesses, project sponsors can and should evaluate alternate route alignments and transportation facilities that minimize the displacement of homes and businesses. An iterative design and impact analysis would help where impacts to homes or businesses are involved. Potential impacts should be minimized to the extent feasible. If possible, existing rights-of-way should be used. **MM-POP3:** Project sponsors can and should develop a construction schedule that minimizes potential neighborhood deterioration from protracted waiting periods between right-of-way acquisition and construction. **MM-POP4:** Project sponsors shall mitigate impacts to affordable housing as feasible through construction of affordable units (deed restricted to remain affordable for an appropriate period of time) or payment of any fee established to address loss of affordable housing.	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
The 2012-2035 RTP/SCS will influence the pattern of growth in the region through transportation investments and land use strategies. These investments and land use strategies could contribute to a cumulatively considerable increase in population outside the region.	**MM-POP5:** SCAG's Compass Blueprint strategy will be used to build consensus in the region relating to changes in land use to accommodate future population growth while maintaining the quality of life in the region. **MM-POP6:** SCAG shall work with neighboring planning agencies and MPOs to ensure plans and strategies can accommodate future population growth beyond SCAG's borders.	Significant and Unavoidable
PUBLIC SERVICES AND UTILITIES		
Police, Fire and Emergency Services		
Potential to affect the level of transportation-related public services, such as police and fire/emergency personnel in the SCAG region.	**MM-PS1:** Project implementation agencies can and should ensure that prior to construction all necessary local and state road and railroad encroachment permits are obtained. The project implementation agency can and should also comply with all applicable conditions of approval. As deemed necessary by the governing jurisdiction, the road encroachment permits may require the contractor to prepare a traffic control plan in accordance with professional engineering standards prior to construction. Traffic control plans can and should include the following requirements: • Identification of all roadway locations where special construction techniques (e.g., directional drilling or night construction) would be used to minimize impacts to traffic flow. • Development of circulation and detour plans to minimize impacts to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone. • Scheduling of truck trips outside of peak morning and evening commute hours. • Limiting of lane closures during peak hours to the extent possible. • Usage of haul routes minimizing truck traffic on local roadways to the extent possible. • Inclusion of detours for bicycles and pedestrians in all areas potentially affected by project construction. • Installation of traffic control devices as specified in the California Department of Transportation Manual of Traffic Controls for Construction and Maintenance Work Zones. • Development and implementation of access plans for highly sensitive land uses such as police and fire stations, transit stations, hospitals, and schools. The access plans would be developed with the facility owner or administrator. To minimize disruption of emergency vehicle access, affected jurisdictions can and should be asked to identify detours for emergency vehicles, which will then be posted by the contractor. Notify in advance the facility owner or operator of the timing, location, and duration of construction activities and the locations of detours and lane closures. • Storage of construction materials only in designated areas.	Less Than Significant

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	• Coordination with local transit agencies for temporary relocation of routes or bus stops in work zones, as necessary. **MM-PS2:** Project sponsors can and should identify projects in the 2012-2035 RTP/SCS that require police protection, fire service, and emergency medical service and can and should coordinate with local fire and police departments to ensure that the existing public services would be able to handle the increase in demand for their services. If the current levels of services at the project site are found to be inadequate, infrastructure improvements and/or personnel requirements for the appropriate public service can and should be identified in each project's CEQA documentation.	
Potential to result in exposure to wildfires and hazards as new or expanded infrastructure is constructed within areas susceptible to these threats, resulting in an increased need for police, fire and emergency personnel.	**MM-PS3:** Project sponsors can and should ensure that during project construction, all construction vehicles and equipment will be fitted with spark arrestors to minimize accidental ignition of dry construction debris and surrounding dry vegetation. **MM-PS4:** Project sponsors can and should encourage the use of fire-resistant vegetation native to Southern California and/or to the local microclimate (e.g., vegetation that has high moisture content, low growth habits, ignition-resistant foliage, or evergreen growth), eliminate brush and chaparral, and discourage the use of fire-promoting species especially non-native, invasive species (e.g., pampas grass, fennel, mustard, or the giant reed) in the immediate vicinity of development in areas with high fire threat. **MM-PS5:** Project sponsors can and should encourage natural re-vegetation or seeding with local, native species after a fire and discourage re-seeding of non-native, invasive species to promote healthy, natural ecosystem re-growth. Native vegetation is more likely to have deep root systems that prevent slope failure and erosion of burned areas than shallow-rooted non-natives. **MM-PS6:** Project sponsors can and should submit a fire safety plan (including phasing) to the Lead Agency and local fire agency for their review and approval. The fire safety plan can and should 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. **MM-PS7:** SCAG shall and local jurisdictions can and should discourage development on potentially hazardous developments in hillsides, canyons, areas with steep slopes or that are susceptible to flooding, earthquakes, wildfire and other known hazards, and areas with limited access for emergency equipment. **MM-PS8:** SCAG shall and local jurisdictions can and should promote Fire-wise Land Management: by encouraging the use of fire-resistant vegetation and the elimination of brush and chaparral in the immediate vicinity of development in areas with high fire threat. **MM-PS9:** SCAG shall and local jurisdictions can and should shall promote Fire Management Planning that help reduce fire threats in the region as part of the Compass Blueprint process and other ongoing regional planning efforts **MM-PS10:** SCAG shall and local jurisdictions can and should encourage the use of fire-resistant materials when constructing projects in areas with high fire threat.	Significant and Unavoidable
Potential to contribute to regional	**MM-PS11:** The growth inducing potential of individual RTP projects shall be carefully evaluated so that the full implications of the projects are understood. Individual environmental documents shall quantify indirect impacts (growth that could be	Significant and

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
cumulatively considerable impacts to the staffing level and response times of police, fire and emergency services in southern California.	facilitated or induced) on public services and utilities to the extent feasible. Lead and responsible agencies can and should then make any necessary adjustments to the applicable General Plan. Any such identified adjustment shall be communicated to SCAG.	Unavoidable
Educational Facilities		
Potential to increase demand for school facilities	**MM-PS12:** Project sponsors can and should undertake project-specific review of the impacts to educational facilities as part of project specific environmental review. For any identified impacts, project sponsors can and should ensure that the appropriate school district fees are paid in accordance with State law. The project sponsors or local jurisdiction can and should be responsible for ensuring adherence to required mitigation. SCAG should be provided with documentation of compliance with any necessary mitigation measures.	Significant and Unavoidable
Potential to contribute to a cumulatively considerable demand for schools that exceeds capacity.	See Mitigation Measures **MM-PS12**.	Significant and Unavoidable
Recreational Facilities		
Potential to result in a substantial loss or disturbance of existing open space and recreational lands.	**MM-PS13:** Project sponsors can and should ensure that projects are consistent with federal, state, and local plans that preserve open space. **MM-PS14:** Project sponsors can and should consider corridor realignment, buffer zones and setbacks, and berms and fencing where feasible, to avoid open space and recreation land and to reduce conflicts between transportation uses and open space and recreation lands. **MM-PS15:** Project sponsors can and should identify open space areas that could be preserved and shall include mitigation measures (such as dedication or payment of in-lieu fees) for the loss of open space. **MM-PS16:** Prior to final approval of each project, the project sponsor can and should conduct the appropriate project-specific environmental review, including consideration of loss of open space. Potential significant impacts to open space shall be mitigated, as feasible. The project sponsors or local jurisdiction can and should be responsible for ensuring adherence to the mitigation measures prior to construction. **MM-PS19:** Local jurisdictions can and should prepare a Needs Assessment to determine the level of adequate community open space level for their areas. **MM-PS20:** Local jurisdictions can and should work with SCAG to identify regionally significant open space resources within their	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	jurisdictions as feasible and appropriate.	
Potential to increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facilities would occur.	**MM-PS21:** Where practical and feasible, project sponsors and local jurisdictions can and should consider increasing the accessibility to natural areas and lands for outdoor recreation. Such measures can and should be coordinated with local and regional open space planning or management agencies. **MM-PS22:** Local jurisdictions can and should encourage multiple use spaces and encourage redevelopment in areas where it will provide more opportunities for recreational uses and access to natural areas close to the urban core. **MM-PS23:** Project level mitigation for significant cumulative and growth-inducing impacts on open space resources can and should include the conservation of natural lands, community open space and important farmland through existing projects in the region. **MM-PS24:** Local governments can and should consider the most recent annual report on open space conservation in planning and evaluating projects and programs in areas with regionally significant open space resources. **MM-PS25:** Local governments can and should encourage patterns of urban development and land use, which reduce costs on infrastructure and make better use of existing facilities. Strategies local governments can and should pursue include: • Increase the accessibility to natural areas lands for outdoor recreation. • Promote infill development and redevelopment to revitalize existing communities • Utilize "green" development techniques • Promote water-efficient land use and development. **MM-PS26:** Project sponsors and local governments can and should encourage multiple use spaces and encourage redevelopment in areas where it will provide more opportunities for recreational uses and access to natural areas close to the urban core. **MM-PS27:** Future impacts to open space and recreation lands shall be avoided through cooperation, information sharing, and program development as part of SCAG's ongoing regional planning efforts. **MM-PS28:** SCAG shall support local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection. **MM-PS29:** SCAG shall encourage member jurisdictions to work as partners to address regional outdoor recreation needs and to acquire the necessary funding for the implementation of their plans and programs. This should be done, in part, by consulting with agencies and organizations that have active open space work plans. **MM-PS30:** SCAG shall support local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection. **MM-PS31:** SCAG shall coordinate with local agencies facilitate planning and funding opportunities for regional open space.	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	MM-PS32: SCAG shall continue to work with the state to develop approaches for evaluating environmental impacts within the Compass Blueprint program, particularly energy, air quality, water, and open space and habitat. **MM-PS33:** SCAG shall encourage member jurisdictions that have trails and trail segments determined to be regionally significant to work together to support regional trail networks. SCAG should encourage joint use of utility, transportation and other rights-of-way, greenbelts, and biodiversity areas **MM-PS34:** SCAG shall consider consistency with ongoing regional open space planning in funding opportunities and programs administered by SCAG.	
Solid Waste Disposal and Transfer Facilities		
Construction necessary to implement the 2012-2035 RTP/SCS would affect the demand for solid waste services in the SCAG region.	**MM-PS35:** Project sponsors for projects identified in the 2012-2035 RTP/SCS can and should comply with applicable regulations related to solid waste disposal. **MM-PS36:** Projects sponsors can and should work with the respective local jurisdiction's Recycling Coordinator to ensure that source reduction techniques and recycling measures are incorporated into project construction. **MM-PS37:** The amount of solid waste generated during construction will be estimated prior to construction, and appropriate disposal sites will be identified and utilized. **MM-PS36:** Project sponsors can and should integrate green building measures into project design such as those identified in the U.S. Green Building Council's Leadership in Energy and Environmental Design, energy Star Homes, Green Point Rated Homes, and the California Green Builder Program. These measures could include the following: • Reuse and minimization of construction and demolition (C&D) debris and diversion of C&D waste from landfills to recycling facilities. • The inclusion of a waste management plan that promotes maximum C&D diversion. • Source reduction through (1) use of materials that are more durable and easier to repair and maintain, (2) design to generate less scrap material through dimensional planning, (3) increased recycled content, (4) use of reclaimed materials, and (5) use of structural materials in a dual role as finish material (e.g. stained concrete flooring, unfinished ceilings, etc.). • Reuse of existing structure and shell in renovation projects. • Design for deconstruction without compromising safety. • Design for flexibility through the use of moveable walls, raised floors, modular furniture, moveable task lighting and other reusable building components. • Development of indoor recycling program and space. **MM-PS37:** Local jurisdictions and waste management agencies can and should discourage the siting of new landfills unless all other waste reduction and prevention actions have been fully explored. If landfill siting or expansion is necessary, landfills can and should be sited with an adequate landfill-owned, undeveloped land buffer to minimize the potential adverse impacts of the landfill in neighboring communities. **MM-PS38:** Project sponsors can and should discourage exporting of locally generated waste outside of the SCAG region during	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	the construction and implementation of a project. Disposal within the county where the waste originates can and should be encouraged as much as possible. Green technologies for long-distance transport of waste (e.g., clean engines and clean locomotives or electric rail for waste-by-rail disposal systems) and consistency with SCAQMD and 2012-2035 RTP/SCS policies can and should be required. **MM-PS39:** Project sponsors can and should encourage waste reduction goals and practices and look for opportunities for voluntary actions to exceed the 50 percent waste diversion target. **MM-PS40:** Project sponsors and local jurisdictions can and should encourage the development of local markets for waste prevention, reduction, and recycling practices by supporting recycled content and green procurement policies, as well as other waste prevention, reduction and recycling practices. **MM-PS41:** Local jurisdictions can and should develop ordinances that promote waste prevention and recycling activities such as: requiring waste prevention and recycling efforts at all large events and venues; implementing recycled content procurement programs; and developing opportunities to divert food waste away from landfills and toward food banks and composting facilities. **MM-PS42:** Local jurisdictions and waste management agencies can and should develop alternative waste management strategies such as composting, recycling, and conversion technologies. **MM-PS43:** Project sponsors, local jurisdictions and waste management agencies, where practical and feasible, can and should develop and site composting, recycling, and conversion technology facilities that have minimum environmental and health impacts. **MM-PS44:** Local jurisdictions can and should require the reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard). **MM-PS45:** Project sponsors can and should integrate reuse and recycling into residential industrial, institutional and commercial projects. **MM-PS46:** Local jurisdictions can and should provide easy and convenient recycling opportunities for residents, the public, and tenant businesses. **MM-PS47:** Local jurisdictions can and should provide education and publicity about reducing waste and available recycling services.	
Potential to result in a cumulatively considerable demand on solid waste facilities that exceeds regional capacity.	**MM-PS48:** The California Integrated Waste Management Board can and should continue to enforce solid waste diversion mandates that are enacted by the Legislature. **MM-PS49:** Local jurisdictions can and should continue to adopt programs to comply with state solid waste diversion rate mandates and, where possible, can and should encourage further recycling to exceed these rates. **MM-PS50:** Local jurisdictions can and should implement or expand city or county-wide recycling and composting programs for residents and businesses. This could include extending the types of recycling services offered (e.g., to include food and green waste recycling) and providing public education and publicity about recycling services.	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	MM-PS51: Local jurisdictions, waste management agencies and SCAG can and should coordinate regional approaches and strategic siting of waste management facilities. **MM-PS52:** Local jurisdictions and waste management agencies can and should encourage and, where practical and feasible, facilitate the creation of synergistic linkages between community businesses and the development of eco-industrial parks and materials exchange centers where one entity's waste stream becomes another entity's raw material. **MM-PS53:** Local jurisdictions and waste management agencies can and should prioritize siting of new solid waste management facilities including recycling, composting, and conversion technology facilities in conjunction with existing waste management or material recovery facilities. **MM-PS54:** Local jurisdictions and waste management agencies can and should increase programs to educate the public and increase awareness of reuse, recycling, composting, and green building benefits and raise consumer education issues at the county and city level, as well as at local school districts and education facilities. **MM-PS55:** For projects identified in the 2012-2035 RTP/SCS that require solid waste collection, project sponsors will coordinate with the local public works department to ensure that the existing public services and utilities would be able to handle the increase. If the current infrastructure servicing the project site is found to be inadequate, infrastructure improvements for the appropriate public service or utility can and should be identified in each project's CEQA documentation. **MM-PS56:** The growth inducing potential of individual projects can and should be carefully evaluated so that the full implications of the projects are understood. Individual environmental documents should quantify indirect impacts (growth that could be facilitated or induced) on public services and utilities to the extent feasible. Lead and responsible agencies then will make any necessary adjustments to the applicable General Plan. Any such identified adjustment should be communicated to SCAG.	
Energy		
Construction necessary to implement the 2012-2035 RTP/SCS may uncover and potentially sever underground utility lines (electric and natural gas).	**MM-PS57:** Prior to construction, the project implementation agency can and should identify the locations of existing utility lines. The contractor shall avoid all known utility lines during construction.	Significant and Unavoidable
Potential to use electricity, natural gas, gasoline, diesel, and other non-renewable energy types in the construction and	**MM-PS58:** In reviewing projects Lead Agencies and project sponsors can and should consider energy implications of construction processes. In general the most energy efficient construction process and long-term operational design can and should be selected unless there is an overriding reason why not. **MM-PS59:** Local jurisdictions can and should include energy analyses in environmental documentation and general plans with the goal of conserving energy through the wise and efficient use of energy. For any identified energy impacts, appropriate mitigation measures can and should be developed and monitored. SCAG recommends the use of Appendix F, Energy	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
expansion of the regional transportation system and anticipated development.	Conservation, of the *CEQA Guidelines.* **MM-PS60:** Project sponsors can and should consider the most cost-effective alternative and renewable energy generation facilities. **MM-PS61:** Project sponsors can and should require that projects use efficient lighting. (Fluorescent lighting uses approximately 75% less energy than incandescent lighting to deliver the same amount of light.) **MM-PS62:** Project sponsors can and should require measures that reduce the amount of water sent to the sewer system. (Reduction in water volume sent to the sewer system means less water has to be treated and pumped to the end user, thereby saving energy.) **MM-PS63:** Project sponsors can and should pursue incentives to encourage the use of energy efficient equipment and vehicles. **MM-PS64:** State and federal lawmakers and regulatory agencies can and should pursue the design of programs to either require or incentivize the expanded availability including the expansion of alternative fuel filling stations and use of alternative-fuel vehicles to reduce the impact of shifts in petroleum fuel supply and price. **MM-PS65:** Local jurisdictions can and should consider various best practices and technological improvements that can reduce the consumption of fossil fuels, such as: • Expanding light-duty vehicle retirement programs • Increasing commercial vehicle fleet modernization • Implementing driver training module on fuel consumption • Replacing gasoline powered mowers with electric mowers • Reducing idling from construction equipment • Incentivizing alternative fuel vehicles and equipment • Developing infrastructure for alternative fueled vehicles • Increasing use and mileage of High Occupancy Vehicle (HOV), High Occupancy Toll (HOT) and dedicated Bus Rapid Transit (BRT) lanes • Implementing truck idling rule, devices, and truck-stop electrification • Requiring electric truck refrigerator units • Reducing locomotives fuel use • Modernizing older off-road engines and equipment • Implementing cold ironing at ports • Encouraging freight mode shift • Limit use and develop fleet rules for construction equipment • Requiring zero-emission forklifts • Developing landside port strategy with alternative fuels, clean engines, and electrification **MM-PS66:** Local jurisdictions or agencies with purview over utilities can and should, as practical and feasible, streamline permitting and provide public information to facilitate accelerated construction of geothermal, solar and wind power generation	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	facilities and transmission line improvements. **MM-PS67:** Utilities can and should increase capacity of existing transmission lines to meet forecast demand that supports sustainable growth, where feasible and appropriate in coordination with local planning agencies. **MM-PS68:** Project sponsors can and should support programs to reduce single occupancy vehicle trips such as telecommuting, ridesharing, alternative work schedules, and parking cash-outs. **MM-PS69:** Project sponsors can and should submit projected electricity and natural gas demand calculations to the local electricity or natural gas provider, for any project anticipated to require substantial utility consumption. Any infrastructure improvements necessary for project construction can and should be completed according to the specifications of the energy provider. **MM-PS70:** Project sponsors can and should encourage, to the extent practical and feasible, ensure that new buildings incorporate solar panels in roofing and tap other renewable energy sources to offset new demand on conventional power sources. For example, transit providers can and should, as feasible, assure that designers of new transit stations incorporate solar panels in roofing. **MM-PS71:** Project sponsors can and should encourage energy efficient design for buildings, potentially including strengthening local building codes for new construction and renovation to achieve a higher level of energy efficiency. This may include strengthening local building codes for new construction and renovation to require a higher level of energy efficiency. **MM-PS72:** Local jurisdictions can and should seek funding through utility-sponsored programs to conduct energy efficiency "tune-ups" of existing buildings, as practical and feasible, by checking, repairing, and readjusting heating, ventilation, air conditioning, lighting, hot water equipment, insulation and weatherization. **MM-PS73:** Project sponsors can and should provide individualized energy management services for large energy users. **MM-PS74:** Local jurisdictions and project sponsors can and should encourage the use of energy efficient appliances and office equipment. **MM-PS75:** Project sponsors can and should pursue incentives and technical assistance for lighting efficiency. **MM-PS76:** Local jurisdictions can and should provide public education and publicity about energy efficiency programs and incentives in cooperation with local utility providers. **MM-PS77:** If a carbon trading system is established, a lead agency may consider whether carbon offsets would be an appropriate means of project mitigation. The project sponsor could, for example, fund off-site projects (e.g., alternative energy projects) that will reduce carbon emissions, or could purchase "credits" from another entity that will fund such projects. The lead agency can and should ensure that any mitigation taking the form of carbon offsets is specifically identified and that such mitigation will in fact occur **MM-PS78:** Local jurisdictions can and should encourage the integration of green building measures into project design and zoning such as those identified in the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED), Energy Star Homes, Green Point Rated Homes, and the California Green Builder Program. Energy saving measures for new and remodeled buildings include:	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	• Using energy efficient materials in building design, construction, rehabilitation, and retrofit • Encouraging new development to exceed Title 24 energy efficiency requirements • Developing Cool Communities measures including tree planting and light-colored roofs. These measures focus on reducing ambient heat, which reduces energy consumption related to air conditioning and other cooling equipment. • Utilizing efficient commercial/residential space and water heaters: This could include the advertisement of existing and/or development of additional incentives for energy efficient appliance purchases to reduce excess energy use and save money. Federal tax incentives are provided online at http://www.energystar.gov/index.cfm?c=Productspr_tax_credits • Encouraging landscaping that requires no additional irrigation: utilizing native, drought tolerant plants can reduce water usage up to 60 percent compared to traditional lawns. • Encouraging combined heating and cooling (CHP), also known as cogeneration, in all buildings. • Encouraging neighborhood energy systems, which allow communities to generate their own electricity • Orienting streets and buildings for best solar access • Encouraging buildings to obtain at least 20% of their electric load from renewable energy **MM-PS79:** Project sponsors can and should install energy efficient lighting (e.g., light emitting diodes (LEDs)), heating and cooling systems, appliances, equipment, and control systems. **MM-PS80:** Project sponsors can and should use passive solar design, e.g., orient buildings and incorporate landscaping to maximize passive solar heating during cool seasons, minimize solar heat gain during hot seasons, and enhance natural ventilation. **MM-PS81:** Project sponsors can and should design buildings to take advantage of sunlight. **MM-PS82:** Project sponsors can and should install light colored “cool” roofs and cool pavements. **MM-PS83:** Install efficient lighting, (including LEDs) for traffic, street and other outdoor lighting. **MM-PS84:** Project sponsors can and should reduce unnecessary outdoor lighting. **MM-PS85:** Project sponsors can and should use automatic covers, efficient pumps and motors, and solar heating for pools and spas. **MM-PS86:** Project sponsors can and should provide education on energy efficiency to residents, customers and/or tenants. **MM-PS87:** Project sponsors can and should use paving materials with a Solar Reflective Index (SRI) of at least 29, or open grid paving systems. **MM-PS88:** Project sponsors can and should use roofing material with SRI of at least 29 on covered parking (underground, beneath decking or roofs, or beneath a building). **MM-PS89:** Local jurisdictions can and should adopt a Heat Island Mitigation Plan that requires cool roofs, cool pavements, and strategically placed shade trees, and actively inspect and enforce state requirements for cool roofs on non-residential re-roofing projects.	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	MM-PS90: Local jurisdictions can and should pursue policies and programs to improve energy efficiency of existing buildings. **MM-PS91:** Local jurisdictions can and should require the performance of energy audits for residential and commercial buildings prior to completion of sale, and that audit results and information about opportunities for energy efficiency improvements be presented to the buyer. **MM-PS92:** Local jurisdictions can and should create an outreach and incentive program to promote energy efficiency and conservation in the community, including: • Launch an "energy efficiency challenge" campaign for community residents; • Implement a low-income weatherization assistance program; • Implement conservation campaigns specifically targeted to residents, and separately to businesses; • Promote the purchase of Energy Star® appliances, including, where feasible, incentive grants and vouchers; • Promote participation in the local "Green Business" program; • Distribute free CFL bulbs or other efficiency fixtures to community members; • Offer exchange programs for high-energy-use items, such as halogen torchiere lamps; • Adopt an ordinance requiring energy upgrades at time of property sale. **MM-PS93:** Project sponsors can and should install solar, wind, and geothermal power systems and solar hot water heaters. **MM-PS94:** Project sponsors can and should install solar panels on unused roof and ground space and over carports and parking areas. **MM-PS95:** Project sponsors can and should include energy storage where appropriate to optimize renewable energy generation systems and avoid peak energy use. **MM-PS96:** Project sponsors can and should use combined heat and power (CHP) in appropriate applications. **MM-PS97:** Local jurisdictions can and should identify possible sites for production of renewable energy (such as solar, wind, small hydro, and biogas), as compatible with surrounding uses, and protect and promote that use, including: • Designate suitable sites to prioritize their development for renewable energy generation; • Evaluate potential land use, environmental, economic, and other constraints on that use, and mitigate such constraints, as feasible; • Adopt measures to protect the renewable energy use of the sites and their resources, such as utility easements, rights-of-way, and land set-a-sides. **MM-PS98:** Local jurisdictions can and should allow renewable energy projects in areas zoned for open space, where consistent with the Open Space element, and other uses and values. **MM-PS99:** Local jurisdictions can and should promote and require renewable energy generation, and co-generation projects where feasible and appropriate. **MM-PS100:** Local jurisdictions can and should require that new office/retail/commercial or industrial development, or major rehabilitation (e.g., additions of 25,000 square feet commercial, or 100,000 square feet industrial) incorporate renewable energy generation either on- or off-site to provide 15 percent or more of the project's energy needs.	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	MM-PS101: Local jurisdictions can and should promote and encourage cogeneration projects for commercial and industrial facilities, provided they meet all applicable air quality standards and provide a net reduction in GHG emissions associated with energy production. **MM-PS102:** Local jurisdictions can and should require that, where feasible, all new buildings be constructed to allow for easy, cost-effective installation of solar energy systems in the future, using such "solar-ready" features as: • Designing the building to include optimal roof orientation (between 20 to 55 degrees from the horizontal), with sufficient south-sloped roof surface; • Clear access without obstructions (chimneys, heating and plumbing vents, etc.) on the south sloped roof; • Designing the roof framing to support the addition of solar panels; • Installation of electrical conduit to accept solar electric system wiring; • Installation of plumbing to support a solar hot water system and provision of space for a solar hot water storage tank. **MM-PS103:** Local jurisdictions can and should require that residential projects of 6 units or more participate in the California Energy Commission's New Solar Homes Partnership, which provides rebates to developers who offer solar power in at least 50 percent of new units, or a program with similar provisions. **MM-PS104:** Local jurisdictions can and should require that any building constructed in whole or in part with local jurisdiction funds incorporate passive solar design features, such as daylighting and passive solar heating, where feasible. **MM-PS105:** Local jurisdictions can and should protect active and passive solar design elements and systems from shading by neighboring structures and trees, as consistent with existing tree shading requirements. **MM-PS106:** Local jurisdictions can and should provide, where feasible, creative financing for renewable energy projects, including subsidized or other low-interest loans, and the option to pay for system installation through long-term assessments on individual property tax bills. **MM-PS107:** Local jurisdictions can and should pursue partnerships with other governmental entities and with private companies and utilities to establish incentive programs for renewable energy. **MM-PS108:** Local jurisdictions can and should establish and maintain a clearinghouse of information on available funding alternatives for renewable energy projects, rates of return, and other information to support developers and community members interested in pursuing renewable energy projects. **MM-PS109:** Local jurisdictions can and should establish targets for the purchase of renewable energy, in excess of the state Renewable Portfolio Standards, using such mechanisms as green tags or renewable energy certificates. **MM-PS110:** Local jurisdictions can and should evaluate the feasibility and effectiveness of using Community Choice Aggregation as a model for providing renewable energy to meet the community's electricity needs, including potential partnerships with other jurisdictions. **MM-PS111:** Local jurisdictions can and should prepare and implement a comprehensive plan to improve energy efficiency of municipal facilities, including: • Conduct energy audits for all municipal facilities;	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	• Retrofit facilities for energy efficiency where feasible and when remodeling or replacing components, including increased insulation, installing green or reflective roofs and low-emissive window glass; • Implement an energy tracking and management system; • Install energy-efficient exit signs, street signs, and traffic lighting; • Install energy-efficient lighting retrofits and occupancy sensors, and institute a “lights out at night” policy; • Retrofit heating and cooling systems to optimize efficiency (e.g., replace chillers, boilers, fans, pumps, belts, etc.); • Install Energy Star® appliances and energy-efficient vending machines; • Improve efficiency of water pumping and use at municipal facilities, including a schedule to replace or retrofit system components with high-efficiency units (i.e., ultra-low-flow toilets, fixtures, etc.); • Provide chilled, filtered water at water fountains and taps in lieu of bottled water; • Install a central irrigation control system and time its operation for off-peak use; • Adopt an accelerated replacement schedule for energy inefficient systems and components. **MM-PS112:** Local jurisdictions can and should require that any newly constructed, purchased, or leased municipal space meet minimum standards as appropriate, such as: • Requirements for new commercial buildings to meet LEED criteria established by the U.S. Green Building Council; • Requirements for new residential buildings to meet criteria of the Energy Star® New Homes Program established by U.S. EPA; • Incorporation of passive solar design features in new buildings, including daylighting and passive solar heating; • Retrofitting of existing buildings to meet standards under Title 24 of the California Building Energy Code, or to achieve a higher performance standard as established by the local jurisdiction; • Retrofitting of existing buildings to decrease heat gain from non-roof impervious surfaces with cool paving, landscaping, and other techniques. • Training & Support: Local jurisdictions or agencies can and should ensure that staff receives appropriate training and support to implement objectives and policies to reduce GHG emissions, including: • Provide energy efficiency training to design, engineering, building operations, and maintenance staff; • Provide information on energy use and management, including data from the tracking and management system, to managers and others making decisions that influence energy use; • Provide energy design review services to departments undertaking new construction or renovation projects, to facilitate compliance with LEED standards. **MM-PS113:** Local jurisdictions can and should collaborate with local energy suppliers and distributors to establish energy conservation programs, Energy Star® appliance change-out programs, rebates, vouchers, and other incentives to install energy-efficient technology and products and to cooperate on advertising. **MM-PS114:** SCAG shall encourage methane recovery in local landfills and wastewater treatment plants to generate electricity. **MM-PS115:** SCAG shall continue to consider energy uncertainty impacts prior to the development of the next RTP/SCS. Topics that shall be considered include: • How the price and availability of transportation fuels affects revenues and demand; • How increases in fuel efficiency could affect revenues and emissions;	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	• How the cost of commuting and personal travel affects mode choice and growth patterns; • How the cost of goods movement affects international trade and employment; or • How the escalation of fuel prices affects the cost of infrastructure construction, maintenance and operation. **MM-PS116:** SCAG shall convene key stakeholders to evaluate and where feasible, recommend transportation measures such as congestion pricing, a refined regional goods movement system and technologies that reduce fossil fuel consumption. **MM-PS117:** SCAG shall encourage clean post-recycle conversion technologies to produce energy or technologies that offset energy use or air emissions. **MM-PS118:** SCAG shall continue to develop energy efficiency and green building guidance to provide direction on specific approaches and models and to specify levels of performance for regionally significant projects to be consistent with regional plans. **MM-PS119:** SCAG shall encourage the federal and state government to increase clean, cost-effective, reliable, domestic renewable energy generation, such as solar and wind turbines. **MM-PS120**: SCAG shall continue to promote electric vehicle penetration throughout the region through on-going electric vehicle readiness efforts. **MM-PS121:** SCAG shall encourage the federal government to increase the Corporate Average Fuel Economy (CAFE) to a level that will reduce the region's dependence on petroleum and reduce greenhouse gas emissions. **MM-PS122:** SCAG shall continue to pursue partnerships with Southern California Edison, municipal utilities, and the California Public Utilities Commission to promote energy efficiency and reduce greenhouse gas emissions in the region. **MM-PS123:** SCAG shall continue to develop, in coordination with the California Air Resources Board, a data and information collection and analysis system that provides an understanding of energy demand and greenhouse gas emissions in the SCAG region. **MM-PS124:** SCAG shall continue to work with local jurisdictions and energy providers, through its Energy and Environment Committee, and administration of the Clean Cities Program as well as by other means, to encourage regional-scale planning for improved energy management. Future impacts to energy shall be minimized through cooperative planning, and information sharing within the SCAG region	
Potential to contribute to a cumulatively considerable increase in non- renewable energy use.	**MM-PS57** through **MM-PS124** would address cumulative energy impacts.	Significant and Unavoidable
TRANSPORTATION, TRAFFIC, AND SECURITY		
Potential to increase total daily Vehicle	**MM-TR1:** SCAG shall establish a forum where policy-makers can be educated and can develop consensus on regional transportation safety and security policies	Significant and

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
Miles of Travel (VMT) in 2035 compared to current daily VMT. The Plan would result in a significant impact related to VMT.	**MM-TR2:** SCAG shall work with local officials to assist with implementation of regional transportation safety and security policies. **MM-TR3:** SCAG shall conduct workshops focused on Smart Growth strategies. Project-specific workshops should be held by local agencies. **MM-TR4:** SCAG shall help ensure the rapid repair of transportation infrastructure in the event of an emergency. This will be accomplished by SCAG, in cooperation with local and State agencies, identifying critical infrastructure needs necessary for: a) emergency responders to enter the region, b) evacuation of affected facilities, and c) restoration of utilities. In addition, SCAG shall establish transportation infrastructure practices that promote and enhance security. **MM-TR5:** SCAG shall continue to promote the use of intelligent transportation system (ITS) technologies that enhance transportation security. SCAG should work to expand the use of ITS to improve surveillance, monitoring and distress notification systems and to assist in the rapid evacuation of disaster areas. SCAG shall facilitate the incorporation of security into the Regional ITS Architecture. Transit operators should incorporate ITS technologies as part of their security and emergency preparedness and share that information with other operators. Aside from deploying ITS technologies for advanced customer information, transit agencies should work intensely with ethnic, local and disenfranchised communities through public information / outreach sessions ensuring public participation is utilized to its fullest. In case of evacuation, these transit dependent persons may need additional assistance to evacuate to safety. **MM-TR6:** SCAG shall establish transportation infrastructure practices that promote and enhance security. SCAG shall work with transportation operators to plan and coordinate transportation projects, as appropriate, with DHS grant projects, to enhance the regional transit security strategy (RTSS). SCAG shall establish transportation infrastructure practices that identify and prioritize the design, retrofit, hardening, and stabilization of critical transportation infrastructure to prevent failure, to minimize loss of life and property, injuries, and avoid long term economic disruption. SCAG shall establish a Transportation Security Working Group (TSWG) with goals of 2012-2035 RTP/SCS consistency with RTSS, and to find ways SCAG programs can enhance RTSS. **MM-TR7:** SCAG shall help to enhance the region's ability to deter and respond to acts of terrorism, human-caused or natural disasters through regionally cooperative and collaborative strategies. SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety security policies. **MM-TR8:** SCAG shall help to enhance the region's ability to deter and respond to terrorist incidents, human-caused or natural disasters by strengthening relationship and coordination with transportation. This will be accomplished by the following: • SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety security policies. • SCAG shall encourage all SCAG elected officials are educated in NIMS. • SCAG shall work with partner agencies, federal, State and local jurisdictions to improve communications and interoperability and to find opportunities to leverage and effectively utilize transportation and public safety/security resources in support of this effort. **MM-TR9:** SCAG shall work to enhance emergency preparedness awareness among public agencies and with the public at large. **MM TR10:** SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety security policies.	Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	MM-TR11: SCAG shall work to improve the effectiveness of regional plans by maximizing the sharing and coordination of resources that would allow for proper response by public agencies. **MM-TR12:** SCAG shall encourage and provide a forum for local jurisdictions to develop mutual aid agreements for essential government services during any incident recovery **MM-TR13:** SCAG shall help to enhance the capabilities of local and regional organizations, including first responders, through provision and sharing of information. This will be accomplished by: • SCAG shall work with local agencies to collect regional GeoData in a common format, and provide access to the GeoData for emergency planning, training and response. • SCAG shall establish a forum for cooperation and coordination of these plans and programs among the regional partners including first responders and operations agencies • SCAG shall develop and establish a regional information sharing strategy, linking SCAG and its member jurisdictions for ongoing sharing and provision of information pertaining to the region's transportation system and other critical infrastructure. **MM-TR14:** SCAG shall provide the means for collaboration in planning, communication, and information sharing before, during, or after a regional emergency. This will be accomplished by the following: • SCAG shall develop and incorporate strategies and actions pertaining to response and prevention of security incidents and events as part of the on-going regional planning activities. • SCAG shall offer a regional repository of GIS data for use by local agencies in emergency planning, and response, in a standardized format. • SCAG shall enter into mutual aid agreements with other MPOs to provide this data, in coordination with the California OES in the event that an event disrupts SCAG's ability to function. **MM-TR15:** Congestion Pricing: SCAG shall advocate for a regional, market-based system to price or charge for auto trips during peak hours. **MM-TR16:** Beyond the currently financially and institutionally feasible measures included in the 2012-2035 RTP/SCS, SCAG shall identify further reduction in VMT, and fuel consumption that could be obtained through land-use strategies, additional car-sharing programs, additional vanpools, additional bicycle programs, and implementation of a universal employee transit access pass (TAP) program. **MM-TR17:** SCAG shall (for its employees) and local jurisdictions can and should institute teleconferencing, telecommute and/or flexible work hour programs to reduce unnecessary employee transportation. **MM-TR18:** Local jurisdictions can and should create a ride-sharing program. Promote existing ride sharing programs e.g., by designating a certain percentage of parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading for ride sharing vehicles, and providing a web site or message board for coordinating rides. **MM-TR19:** SCAG shall and local jurisdictions can and should create or accommodate car sharing programs, e.g., provide parking spaces for car share vehicles at convenient locations accessible by public transportation. **MM-TR20**: SCAG shall and local jurisdictions can and should provide a vanpool for employees.	

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Impact	Mitigation Measures	Significance After Mitigation
	MM-TR21: Transportation Planning: SCAG shall and local jurisdictions can and should ensure that new developments incorporate both local and regional transit measures into the project design that promote the use of alternative modes of transportation. **MM-TR22:** As may be appropriate, project sponsors can and should submit fair share traffic payments to the local agency for funding capital improvement projects to accommodate future traffic demand in the area. **MM-TR23:** Local jurisdictions can and should coordinate controlled intersections so that traffic passes more efficiently through congested areas. Where traffic signals or streetlights are installed, require the use of Light Emitting Diode (LED) technology. **MM-TR24:** Local jurisdictions can and should promote ride sharing programs e.g., by designating a certain percentage of parking spaces for high-occupancy vehicles, providing larger parking spaces to accommodate vans used for ride-sharing, and designating adequate passenger loading and unloading and waiting areas. **MM-TR25:** Local jurisdictions can and should encourage the use of car-sharing programs such as ZipCar. Accommodations for such programs include providing parking spaces for the car-share vehicles at convenient locations accessible by public transportation. **MM-TR26:** The Plan includes measures intended to reduce vehicle hours of delay. These include: system management, increasing rideshare and work-at-home opportunities to reduce demand on the transportation system, investments in non-motorized transportation, maximizing the benefits of the land use-transportation connection and key transportation investments targeted to reduce delay. SCAG shall encourage local agencies to fully implement these policies and projects. **MM-TR27:** The Plan includes measures intended to reduce daily heavy-duty truck vehicle hours of delay. These include: goods movement capacity enhancements, system management, increasing rideshare and work-at-home opportunities to reduce demand on the transportation system, investments in non-motorized transportation, maximizing the benefits of the land use-transportation connection and key transportation investments targeted to reduce heavy-duty truck delay. SCAG shall encourage local agencies to fully implement these policies and projects. **MM-TR28:** Project sponsors of a commercial use can and should submit to the Lead Agency (or other appropriate government agency) a Transportation Demand Management (TDM) plan containing strategies to reduce on-site parking demand and single occupancy vehicle travel. The sponsor should implement the approved TDM plan. The TDM should include strategies to increase bicycle, pedestrian, transit, and carpools/vanpool use. All four modes of travel should be considered. Strategies to consider include the following: • Inclusion of additional bicycle parking, shower, and locker facilities that exceed the requirement • Construction of bike lanes per the prevailing Bicycle Master Plan (or other similar document) • Signage and striping onsite to encourage bike safety • Installation of pedestrian safety elements (such as cross walk striping, curb ramps, countdown signals, bulb outs, etc.) to encourage convenient crossing at arterials • Installation of amenities such as lighting, street trees, trash and any applicable streetscape plan. • Direct transit sales or subsidized transit passes	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	• Guaranteed ride home program • Pre-tax commuter benefits (checks) • On-site car-sharing program (such as City Car Share, Zip Car, etc.) • On-site carpooling program • Distribution of information concerning alternative transportation options • Parking spaces sold/leased separately • Parking management strategies; including attendant/valet parking and shared parking spaces **MM-TR29:** Project sponsors and construction contractors can and should meet with the appropriate Lead Agency (or other government agency) to determine traffic management strategies to reduce, to the maximum extent feasible, traffic congestion and the effects of parking demand by construction workers during construction of this project and other nearby projects that could be simultaneously under construction. The project sponsor should develop a construction management plan for review and approval by the Lead Agency (or other government agency as appropriate). The plan should include at least the following items and requirements: • A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak traffic hours, detour signs if required, lane closure procedures, signs, cones for drivers, and designated construction access routes. • Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures will occur. • Location of construction staging areas for materials, equipment, and vehicles at an approved location. • A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an onsite complaint manager. The manager should determine the cause of the complaints and should take prompt action to correct the problem. The Lead Agency should be informed who the Manager is prior to the issuance of the first permit. • Provision for accommodation of pedestrian flow. • As necessary, provision for parking management and spaces for all construction workers to ensure that construction workers do not park in on street spaces. • Any damage to the street caused by heavy equipment, or as a result of this construction, should be repaired, at the project sponsor's expense, within one week of the occurrence of the damage (or excessive wear), unless further damage/excessive wear may continue; in such case, repair should occur prior to issuance of a final inspection of the building permit. All damage that is a threat to public health or safety should be repaired immediately. The street should be restored to its condition prior to the new construction as established by the Lead Agency (or other appropriate government agency) and/or photo documentation, at the sponsor's expense, before the issuance of a Certificate of Occupancy. • Any heavy equipment brought to the construction site should be transported by truck, where feasible. • No materials or equipment should be stored on the traveled roadway at any time. • Prior to construction, a portable toilet facility and a debris box should be installed on the site, and properly maintained through project completion. • All equipment should be equipped with mufflers. • Prior to the end of each work-day during construction, the contractor or contractors should pick up and properly	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	dispose of all litter resulting from or related to the project, whether located on the property, within the public rights-of-way, or properties of adjacent or nearby neighbors. **MM-TR30**: Local jurisdictions can and should encourage the use of public transit systems by enhancing safety and cleanliness on vehicles and in and around stations, providing shuttle service to public transit, offering public transit incentives and providing public education and publicity about public transportation services. **MM-TR31:** Local jurisdictions can and should encourage bicycling and walking by incorporating bicycle lanes into street systems in regional transportation plans, new subdivisions, and large developments, creating bicycle lanes and walking paths directed to the location of schools and other logical points of destination and provide adequate bicycle parking, and encouraging commercial projects to include facilities on-site to encourage employees to bicycle or walk to work. **MM-TR32:** Transit agencies can and should encourage bicycling to transit facilities by providing additional bicycle parking, locker facilities, and bike lane access to transit facilities when feasible. **MM-TR33:** Project sponsors can and should ensure that prior to construction all necessary local and State road and railroad encroachment permits are obtained. As deemed necessary by the governing jurisdiction, the road encroachment permits may require the contractor to prepare a traffic control plan in accordance with professional engineering standards prior to construction. Traffic control plans should include the following requirements: • Identification of all roadway locations where special construction techniques (e.g., directional drilling or night construction) would be used to minimize impacts to traffic flow. • Development of circulation and detour plans to minimize impacts to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone. • Scheduling of truck trips outside of peak morning and evening commute hours. • Limiting of lane closures during peak hours to the extent possible. • Usage of haul routes minimizing truck traffic on local roadways to the extent possible. • Inclusion of detours for bicycles and pedestrians in all areas potentially affected by project construction. • Installation of traffic control devices as specified in the California Department of Transportation Manual of Traffic Controls for Construction and Maintenance Work Zones. • Development and implementation of access plans for highly sensitive land uses such as police and fire stations, transit stations, hospitals, and schools. The access plans would be developed with the facility owner or administrator. To minimize disruption of emergency vehicle access, affected jurisdictions should be asked to identify detours for emergency vehicles, which will then be posted by the contractor. Notify in advance the facility owner or operator of the timing, location, and duration of construction activities and the locations of detours and lane closures. • Storage of construction materials only in designated areas • Coordination with local transit agencies for temporary relocation of routes or bus stops in work zones, as necessary. **MM-TR34:** Local jurisdictions can and should meet an identified transportation-related benchmark. **MM-TR35:** Local jurisdictions can and should adopt a comprehensive parking policy that discourages private vehicle use and	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	encourages the use of alternative transportation. **MM-TR36:** Project sponsors can and should build or fund a major transit stop within or near the development. **MM-TR37:** Local jurisdictions and transit agencies can and should provide public transit incentives such as free or low-cost monthly transit passes to employees, or free ride areas to residents and customers. **MM-TR38:** Local jurisdictions and project sponsors can and should promote "least polluting" ways to connect people and goods to their destinations. **MM-TR39:** Local jurisdictions and project sponsors can and should incorporate bicycle lanes, routes and facilities into street systems, new subdivisions, and large developments. **MM-TR40**: Local jurisdictions can and should require amenities for non-motorized transportation, such as secure and convenient bicycle parking. **MM-TR41:** Local jurisdictions can and should ensure that the project enhances, and does not disrupt or create barriers to, non-motorized transportation. **MM-TR42:** Local jurisdictions can and should connect parks and open space through shared pedestrian/bike paths and trails to encourage walking and bicycling. **MM-TR43:** Local jurisdictions can and should create bicycle lanes and walking paths directed to the location of schools, parks and other destination points. **MM-TR44:** Local jurisdictions can and should work with the school districts to improve pedestrian and bike access to schools and to restore or expand school bus service using lower-emitting vehicles. **MM-TR45:** Local jurisdictions and transit agencies can and should provide information on alternative transportation options for consumers, residents, tenants and employees to reduce transportation-related emissions. **MM-TR46:** Local jurisdictions can and should educate consumers, residents, tenants and the public about options for reducing motor vehicle-related greenhouse gas emissions. Include information on trip reduction; trip linking; vehicle performance and efficiency (e.g., keeping tires inflated); and low or zero-emission vehicles. **MM-TR47:** Local jurisdictions can and should purchase, or create incentives for purchasing, low or zero-emission vehicles. **MM-TR48:** Local jurisdictions can and should create local "light vehicle" networks, such as neighborhood electric vehicle systems. **MM-TR49:** Local jurisdictions can and should enforce and follow limits idling time for commercial vehicles, including delivery and construction vehicles. **MM-TR50**: Local jurisdictions can and should provide the necessary facilities and infrastructure to encourage the use of low or zero-emission vehicles. **MM-TR51:** Local jurisdictions can and should reduce GHG emissions by reducing vehicle miles traveled and by increasing or	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	encouraging the use of alternative fuels and transportation technologies. **MM-TR52:** Local jurisdictions can and should reduce VMT-related emissions by encouraging the use of public transit through adoption of new development standards that would require improvements to the transit system and infrastructure, increase safety and accessibility, and provide other incentives. **MM-TR53:** Project Selection: Local jurisdictions can and should give priority to transportation projects that would contribute to a reduction in vehicle miles traveled per capita, while maintaining economic vitality and sustainability. **MM-TR54:** Equal Pedestrian Access Local jurisdictions can and should include separated sidewalks whenever possible, on both sides of all new street improvement projects, except where there are severe topographic or natural resource constraints. **MM-TR55:** Public Involvement: Local jurisdictions can and should carry out a comprehensive public involvement and input process that provides information about transportation issues, projects, and processes to community members and other stakeholders, especially to those traditionally underserved by transportation services. **MM-TR56:** System Interconnectivity: Local jurisdictions can and should create an interconnected transportation system that allows a shift in travel from private passenger vehicles to alternative modes, including public transit, ride sharing, car sharing, bicycling and walking, by incorporating the following: • Ensure transportation centers are multi-modal to allow transportation modes to intersect; • Provide adequate and affordable public transportation choices, including expanded bus routes and service, as well as other transit choices such as shuttles, light rail, and rail; • To the extent feasible, extend service and hours of operation to underserved arterials and population centers or destinations such as colleges; • Focus transit resources on high-volume corridors and high-boarding destinations such as colleges, employment centers and regional destinations; • Coordinate schedules and routes across service lines with neighboring transit authorities; • Support programs to provide “station cars” for short trips to and from transit nodes (e.g., neighborhood electric vehicles); • Study the feasibility of providing free transit to areas with residential densities of 15 dwelling units per acre or more, including options such as removing service from less dense, underutilized areas to do so; • Employ transit-preferential measures, such as signal priority and bypass lanes. Where compatible with adjacent land use designations, right-of-way acquisition or parking removal may occur to accommodate transit-preferential measures or improve access to transit. The use of access management should be considered where needed to reduce conflicts between transit vehicles and other vehicles; • Provide safe and convenient access for pedestrians and bicyclists to, across, and along major transit priority streets; • Use park-and-ride facilities to access transit stations only at ends of regional transitways or where adequate feeder bus service is not feasible. **MM-TR57:** Transit System Infrastructure: Local jurisdictions can and should upgrade and maintain transit system infrastructure to enhance public use, including:	

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Impact	Mitigation Measures	Significance After Mitigation
	• Ensure transit stops and bus lanes are safe, convenient, clean and efficient; • Ensure transit stops have clearly marked street-level designation, and are accessible; • Ensure transit stops are safe, sheltered, benches are clean, and lighting is adequate; • Place transit stations along transit corridors within mixed-use or transit-oriented development areas at intervals of three to four blocks, or no less than one-half mile. **MM-TR58:** Customer Service: Transit agencies can and should enhance customer service and system ease-of-use, including: • Develop a Regional Pass system to reduce the number of different passes and tickets required of system users; • Implement "Smart Bus" technology, using GPS and electronic displays at transit stops to provide customers with "real-time" arrival and departure time information (and to allow the system operator to respond more quickly and effectively to disruptions in service); • Investigate the feasibility of an on-line trip-planning program. **MM-TR59:** Transit Funding: Local jurisdictions can and should prioritize transportation funding to support a shift from private passenger vehicles to transit and other modes of transportation, including: • Give funding preference to improvements in public transit over other new infrastructure for private automobile traffic; • Before funding transportation improvements that increase roadway capacity and VMT, evaluate the feasibility and effectiveness of funding projects that support alternative modes of transportation and reduce VMT, including transit, and bicycle and pedestrian access. **MM-TR60**: Transit and Multimodal Impact Fees: Local jurisdictions can and should assess transit and multimodal impact fees on new developments to fund public transportation infrastructure, bicycle infrastructure, pedestrian infrastructure and other multimodal accommodations. **MM-TR61:** Local jurisdictions can and should implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions. **MM-TR62:** System Monitoring: Local jurisdictions can and should monitor traffic and congestion to determine when and where new transportation facilities are needed in order to increase access and efficiency. **MM-TR63:** Arterial Traffic Management: Local jurisdictions can and should modify arterial roadways to allow more efficient bus operation, including bus lanes and signal priority/preemption where necessary. **MM-TR64:** Signal Synchronization: Local jurisdictions can and should expand signal timing programs where emissions reduction benefits can be demonstrated, including maintenance of the synchronization system, and will coordinate with adjoining jurisdictions as needed to optimize transit operation while maintaining a free flow of traffic. **MM-TR65:** HOV Lanes: Local jurisdictions can and should encourage the construction of high-occupancy vehicle (HOV) lanes or similar mechanisms whenever necessary to relieve congestion and reduce emissions. **MM-TR66:** Delivery Schedules: Local jurisdictions can and should establish ordinances or land use permit conditions limiting the hours when deliveries can be made to off-peak hours in high traffic areas.	

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Impact	Mitigation Measures	Significance After Mitigation
	MM-TR67: Local jurisdictions can and should reduce VMT related-emissions by implementing and supporting trip reduction programs. **MM-TR68:** Ride-Share Programs: Local jurisdictions can and should promote ride sharing programs, including: • Designate a certain percentage of parking spaces for ride-sharing vehicles; • Designate adequate passenger loading, unloading, and waiting areas for ride-sharing vehicles; • Provide a web site or message board for coordinating shared rides; • Encourage private, for-profit community car-sharing, including parking spaces for car share vehicles at convenient locations accessible by public transit; • Hire or designate a rideshare coordinator to develop and implement ridesharing programs. **MM-TR69:** Employer-based Trip Reduction: Local jurisdictions can and should support voluntary, employer-based trip reduction programs, including: • Provide assistance to regional and local ridesharing organizations; • Advocate for legislation to maintain and expand incentives for employer ridesharing programs; • Require the development of Transportation Management Associations for large employers and commercial/ industrial complexes; • Provide public recognition of effective programs through awards, top ten lists, and other mechanisms. **MM-TR70**: Ride Home Programs: Local jurisdictions can and should implement a “guaranteed ride home” program for those who commute by public transit, ride-sharing, or other modes of transportation, and encourage employers to subscribe to or support the program. **MM-TR71:** Local Area Shuttles: Transit agencies can and should encourage and utilize shuttles to serve neighborhoods, employment centers and major destinations. **MM-TR72:** Local jurisdictions and transit agencies can and should create a free or low-cost local area shuttle system that includes a fixed route to popular tourist destinations or shopping and business centers. **MM-TR73:** Local jurisdictions can and should work with existing shuttle service providers to coordinate their services. **MM-TR74:** Low- and No-Travel Employment Opportunities: Local jurisdictions can and should facilitate employment opportunities that minimize the need for private vehicle trips, including: • Amend zoning ordinances and the Development Code to include live/work sites and satellite work centers in appropriate locations; • Encourage telecommuting options with new and existing employers, through project review and incentives, as appropriate. **MM-TR75:** Local jurisdictions can and should support bicycle use as a mode of transportation by enhancing infrastructure to accommodate bicycles and riders, and providing incentives. **MM-TR76:** Development Standards for Bicycles: Local jurisdictions can and should establish standards for new development and	

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Impact	Mitigation Measures	Significance After Mitigation
	redevelopment projects to support bicycle use, including: • Amending the Development Code to include standards for safe pedestrian and bicyclist accommodations, by incorporating the following: o "Complete Streets" policies that foster equal access by all users in the roadway design; o Bicycle and pedestrian access internally and in connection to other areas through easements; o Safe access to public transportation and other non-motorized uses through construction of dedicated paths; o Safe road crossings at major intersections, especially for school children and seniors; o Adequate, convenient and secure bike parking at public and private facilities and destinations in all urban areas; o Street standards will include provisions for bicycle parking within the public right of way. **MM-TR77:** Local jurisdictions can and should require new development and redevelopment projects to include bicycle facilities, as appropriate with the new land use, including: • Construction of weatherproof bicycle facilities where feasible, and at a minimum, bicycle racks or covered, secure parking near the building entrances; • Provision and maintenance of changing rooms, lockers, and showers at large employers or employment centers. • Prohibit projects that impede bicycle and pedestrian access, such as large parking areas that cannot be safely crossed by non-motorized vehicles, and developments that block through access on existing or potential bicycle and pedestrian routes; • Encourage the development of bicycle stations at intermodal hubs, with attended or "valet" bicycle parking, and other amenities such as bicycle rental and repair, and changing areas with lockers and showers; • Conduct a connectivity analysis of the existing bikeway network to identify gaps, and prioritize bikeway development where gaps exist. **MM-TR78:** Bicycle and Pedestrian Trails: Local jurisdictions can and should establish a network of multi-use trails to facilitate safe and direct off-street bicycle and pedestrian travel, and will provide bike racks along these trails at secure, lighted locations **MM-TR79:** Bicycle Safety Program: Local jurisdictions can and should develop and implement a bicycle safety educational program to teach drivers and riders the laws, riding protocols, routes, safety tips, and emergency maneuvers. **MM-TR80**: Bicycle and Pedestrian Project Funding: Local jurisdictions can and should pursue and provide enhanced funding for bicycle and pedestrian facilities and access projects, including, as appropriate: • Apply for regional, State, and federal grants for bicycle and pedestrian infrastructure projects; • Establish development exactions and impact fees to fund bicycle and pedestrian facilities; • Use existing revenues, such as State gas tax subventions, sales tax funds, and general fund monies for projects to enhance bicycle use and walking for transportation. **MM-TR81:** Bicycle Parking: Local jurisdictions can and should adopt bicycle parking standards that ensure bicycle parking sufficient to accommodate 5 to 10 percent of projected use at all public and commercial facilities, and at a rate of at least one per residential unit in multiple-family developments (suggestion: check language with League of American Bicyclists).	

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Impact	Mitigation Measures	Significance After Mitigation
	MM-TR82: Local jurisdictions can and should establish parking policies and requirements that capture the true cost of private vehicle use and support alternative modes of transportation. **MM-TR83:** Parking Policy: Local jurisdictions can and should adopt a comprehensive parking policy to discourage private vehicle use and encourage the use of alternative transportation by incorporating the following: • Reduce the available parking spaces for private vehicles while increasing parking spaces for shared vehicles, bicycles, and other alternative modes of transportation; • Eliminate or reduce minimum parking requirements for new buildings; • "Unbundle" parking (require that parking is paid for separately and is not included in the base rent for residential and commercial space); • Use parking pricing to discourage private vehicle use, especially at peak times; • Create parking benefit districts, which invest meter revenues in pedestrian infrastructure and other public amenities; • Establish performance pricing of street parking, so that it is expensive enough to promote frequent turnover and keep 15 percent of spaces empty at all times; • Encourage shared parking programs in mixed-use and transit-oriented development areas. **MM-TR84:** Event Parking Policies: Local jurisdictions can and should establish policies and programs to reduce onsite parking demand and promote ride-sharing and public transit at large events, including: • Promote the use of peripheral parking by increasing on-site parking rates and offering reduced rates for peripheral parking; • Encourage special event center operators to advertise and offer discounted transit passes with event tickets; • Encourage special event center operators to advertise and offer discount parking incentives to carpooling patrons, with four or more persons per vehicle for on-site parking; • Promote the use of bicycles by providing space for the operation of valet bicycle parking service. **MM-TR85:** Parking "Cash-out" Program: Local jurisdictions can and should require new office developments with more than 50 employees to offer a Parking "Cash-out" Program to discourage private vehicle use. **MM-TR86:** Electric/Alternative Fuel Vehicle Parking: Local jurisdictions can and should require new commercial and retail developments to provide prioritized parking for electric vehicles and vehicles using alternative fuels. **MM-TR87:** Local jurisdictions can and should support and promote the use of low- and zero-emission vehicles, and alternative fuels, and other measures to directly reduce emissions from motor vehicles. **MM-TR88:** Low and Zero Emission Vehicles: Local jurisdictions can and should support and promote the use of low- and zero-emission vehicles, by doing the following: • Develop the necessary infrastructure to encourage the use of zero emission vehicles and clean alternative fuels, such as development of electric vehicle charging facilities and conveniently located alternative fueling stations; • Encourage new construction to include vehicle access to properly wired outdoor receptacles to accommodate ZEV and/or plug in electric hybrids (PHEV);	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	• Encourage transportation fleet standards to achieve the lowest emissions possible, using a mix of alternate fuels, PZEV or better fleet mixes; • Establish incentives, as appropriate, to taxicab owners to use alternative fuel or gas-electric hybrid vehicles. **MM-TR89:** Vehicle Idling: Local jurisdictions can and should enforce State idling laws for commercial vehicles, including delivery and construction vehicles. **MM-TR90**: Pedestrian and Bicycle Promotion: Local jurisdictions can and should work with local community groups and downtown business associations to organize and publicize walking tours and bicycle events, and to encourage pedestrian and bicycle modes of transportation. **MM-TR91:** Local jurisdictions can and should organize events and workshops to promote GHG-reducing activities. **MM-TR92:** Fleet Replacement: Local jurisdictions and agencies can and should establish a replacement policy and schedule to replace fleet vehicles and equipment with the most fuel efficient vehicles practical, including gasoline hybrid and alternative fuel or electric models. **MM-TR93:** Local jurisdictions can and should implement measures to reduce employee vehicle trips and to mitigate emissions impacts from municipal travel. **MM-TR94:** Trip Reduction Program: Local jurisdictions can and should implement a program to reduce vehicle trips by employees, including: • Providing incentives and infrastructure for vanpooling and carpooling, such as pool vehicles, preferred parking, and a website or bulletin board to facilitate ride-sharing; • Providing subsidized passes for mass transit; • Offering compressed work hours, off-peak work hours, and telecommuting, where appropriate; • Offer a guaranteed ride home for employees who use alternative modes of transportation to commute. **MM-TR95:** Bicycle Transportation Support: Local jurisdictions can and should promote and support the use of bicycles as transportation, including: • Providing bicycle stations with secure, covered parking, changing areas with storage lockers and showers, as well as a central facility where minor repairs can be made; • Providing bicycles, including electric bikes, for employees to use for short trips during business hours; • Implementing a police-on-bicycles program; • Providing a bicycle safety program, and information about safe routes to work. **MM-TR96:** Municipal Parking Management: Local jurisdictions can and should implement a Parking Management Program to discourage private vehicle use, including: • Encouraging carpools and vanpools with preferential parking and a reduced parking fee; • Institute a parking cash-out program; • Renegotiate employee contracts, where possible, to eliminate parking subsidies; • Install on-street parking meters with fee structures designed to discourage private vehicle use;	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	• Establish a parking fee for all single-occupant vehicles. **MM-TR97:** Travel Mitigation: Local jurisdictions can and should mitigate business-related travel, especially air travel, through the annual purchase of verified carbon offsets. **MM-TR98:** Transit Access to Municipal Facilities: Local jurisdiction and agency facilities can and should be located on major transit corridors, unless their use is plainly incompatible with other uses located along major transit corridors.	
The Plan would reduce average Vehicle Hours of Delay (VHD) in 2035 compared to current condition. The Plan would result in less than significant impact related to VHD.	No mitigation measures were necessary as the proposed project would not cause a significant impact.	Less Than Significant
Potential to create substantially greater average daily VHD for heavy-duty truck trips in 2035 compared to current condition. The Plan would result in a significant impact related to truck VHD.	**MM-TR1** through **MM-TR98** would address this impact.	Significant and Unavoidable
Potential to increase the percent of work opportunities within 45 minutes travel time by personal vehicle or by transit in 2035 relative to the current condition. This result is considered to be a regional benefit. The Plan would result in a less-than-significant impact related to work commute.	No mitigation measures were necessary as the proposed project would not cause a significant impact.	Less Than Significant

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
Potential to lower system-wide fatality accident rate for all travel modes in 2035 relative to the current condition. The Plan would result in a less-than-significant impact related to transportation fatality rates.	No mitigation measures were necessary as the proposed project would not cause a significant impact.	Less Than Significant
Potential to lower system-wide injury rate for all travel modes in 2035 relative to the current condition. Therefore, the Plan would result in a less-than-significant impact related to transportation injury rates.	No mitigation measures were necessary as the proposed project would not cause a significant impact.	Less Than Significant
Potential to contribute to a cumulatively considerable amount of transportation impacts, such as VMT and all-vehicle VHD, in areas outside of the SCAG region.	**MM-TR1** through **MM-TR98** would address this impact.	Significant and Unavoidable
WATER RESOURES		
Potential to degrade local surface water quality by increased roadway and urban runoff created by 2012-2035 RTP/SCS projects, potentially	**MM-W1:** SCAG shall continue to work with local jurisdictions and water quality agencies, and other means, to encourage regional-scale planning for improved water quality management and pollution prevention. Future impacts to water quality shall be avoided to the extent practical and feasible through cooperative planning, information sharing, and comprehensive pollution control measure development within the SCAG region. This cooperative planning shall occur as part of current and existing coordination, an integral part of SCAG's ongoing regional planning efforts. **MM-W2:** Local jurisdictions can and should encourage new development and industry to locate in those service areas with existing wastewater infrastructure and treatment capacity, making greater use of those facilities prior to incurring new	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
violating water quality standards associated with wastewater and stormwater permits. The 2012-2035 RTP/SCS could alter the existing drainage patterns in ways that would result in substantial erosion or siltation.	infrastructure costs. **MM-W3:** Local jurisdictions can and should promote reduced wastewater system demand by: designing wastewater systems to minimize inflow and increase upstream treatment and infiltration to the extent feasible, reducing overall source water generation by domestic and industrial users, deferring development approvals for industries that generate high volumes of wastewater until wastewater agencies have expanded capacity. **MM-W4:** Wastewater treatment agencies are encouraged to have expansion plans, approvals and financing in place once their facilities are operating at 80 percent of capacity. SCAG shall provide opportunities for information sharing and program development. **MM-W5:** Project sponsors can and should coordinate with the local wastewater provider in order to ensure that existing and/or planned sewer conveyance and treatment facilities are capable of meeting wastewater flow capacity requirements. Each project sponsor can and should identify specific on- and off-site improvements needed to ensure that impacts related to wastewater conveyance capacity are addressed prior to issuance of plans. Sewer capacity clearance from the local wastewater provider will be required at the time that a sewer connection permit application is submitted. **MM-W6:** As appropriate, confirmation of the capacity of the surrounding stormwater and sanitary sewer system and state of repair can and should be completed by a qualified civil engineer with funding from the project sponsor. The project sponsor can and should be responsible for the necessary stormwater and sanitary sewer infrastructure improvements to accommodate the proposed project. In addition, the sponsor can and should be required to pay any fees to improve sanitary sewer infrastructure as may be required by the applicable local agencies. Improvements to the existing sanitary sewer collection system can and should specifically include, but are not limited to, mechanisms to control or minimize increases in infiltration/inflow to offset sanitary sewer increases associated with the proposed project. To the maximum extent practicable, the sponsor will be required to implement Best Management Practices to reduce the peak stormwater runoff from the project site. Additionally, the project sponsor can and should be responsible for payment of any required installation or hook-up fees to the affected service providers. **MM-W7:** Wastewater treatment agencies can and should maximize efficiency of wastewater treatment and pumping equipment. **MM-W8:** Project sponsors with projects requiring the discharge of dredged or fill materials into U.S. waters, including wetlands, can and should comply with sections 404 and 401 of the Clean Water Act including the requirement to obtain a permit from the U.S. Army Corps of Engineers and the governing Regional Water Quality Control Board. **MM-W9:** Project sponsor can and should ensure that natural riparian conditions near projects are maintained, wherever feasible, to minimize the effects of stormwater flows at stream crossings. Where feasible, riparian areas can and should be restored or expanded to mitigate additional impervious surface and associated runoff. **MM-W10:** Prior to construction within the vicinity of a watercourse, the project sponsor can and should obtain all necessary regulatory permits and authorizations from the U.S. Army Corps of Engineers (Corps), Regional Water Quality Control Board (RWQCB), California Department of Fish and Game, California Coastal Commission, and local jurisdictions, and should comply with all conditions issued by applicable agencies. Required permit approvals and certifications may include, but not be limited to the following: • U.S. Army Corps of Engineers (Corps): Section 404. Permit approval from the Corps should be obtained for the placement of dredge or fill material in Waters of the U.S., if any, within the interior of the project site, pursuant to	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	Section 404 of the federal Clean Water Act. • Regional Walter Quality Control Board (RWQCB): Section 401 Water Quality Certification. Certification that the project will not violate state water quality standards is required before the Corps can issue a 404 permit, above. • California Department of Fish and Game (CDFG): Section 1602 Lake and Streambed Alteration Agreement. Work that will alter the bed or bank of a stream requires authorization from CDFG. A qualified environmental consultant can and should be retained and paid for by the project sponsor to make site visits as necessary; and as a follow-up, submit to the Lead Agency a letter certifying that all required conditions have been instituted during the grading activities. **MM-W11:** Prior to issuance of a demolition, grading, or building permit within vicinity of a watercourse project sponsors can and should develop a final detailed landscaping and irrigation plan for review and approval by the appropriate local jurisdiction prepared by a licensed landscape architect or other qualified person. Such a plan should include a planting schedule, detailing plant types and locations, and a system for temporary irrigation of plantings. • Plant and maintain only drought-tolerant plants on the site where appropriate, as well as native and riparian plants in and adjacent to riparian corridors. Along the riparian corridor, native plants should not be disturbed to the maximum extent feasible. Any areas disturbed along the riparian corridor should be replanted with mature native riparian vegetation and be maintained to ensure survival. • All landscaping indicated on the approved landscape plan should be installed prior to the issuance of a Final inspection of the building permit, otherwise permitted. All landscaping areas shown on the approved plans should be maintained in neat and safe conditions, and all plants should be maintained in good growing condition and, whenever necessary replaced with new plant materials to ensure continued compliance with all applicable landscaping requirements. All paving or impervious surfaces should occur only on approved areas. **MM-W12:** Project sponsors can and should comply with the State-wide construction storm water discharge permit requirements including preparation of Storm Water Pollution Prevention Plans for transportation improvement construction projects. Roadway construction projects can and should comply with the Caltrans storm water discharge permit. Best Management Practices can and should be identified and implemented to manage site erosion, wash water runoff, and spill control. **MM-W13:** Project sponsors can and should comply with the requirements of the National Pollutant Discharge Elimination System (NPDES). The project sponsor can and should submit with the application for a building permit (or other construction-related permit) a completed Construction-Permit-Phase Stormwater Supplemental Form. The project drawings submitted for the building permit (or other construction-related permit) should contain a stormwater management plan, for review and approval by the appropriate agency, to manage stormwater run-off and to limit the discharge of pollutants in stormwater after construction of the project to the maximum extent practicable. The post-construction stormwater management plan should include and identify the following: • All proposed impervious surface on the site; • Anticipated directional flows of on-site stormwater runoff; and • Site design measures to reduce the amount of impervious surface area and directly connected impervious surfaces; and	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	• Source control measures to limit the potential for stormwater pollution; • Stormwater treatment measures to remove pollutants from stormwater runoff; and • Hydromodification management measures so that post-project stormwater runoff does not exceed the flow and duration of pre-project runoff, if required under the NPDES permit. The following additional information should be submitted with the post-construction stormwater management plan: • Detailed hydraulic sizing calculations for each stormwater treatment measure proposed; and • Pollutant removal information demonstrating that any proposed manufactured/mechanical (i.e. non-landscape-based) stormwater treatment measure, when not used in combination with a landscape-based treatment measure, is capable or removing the range of pollutants typically removed by landscape-based treatment measures and/or the range of pollutants expected to be generated by the project. All proposed stormwater treatment measures can and should incorporate appropriate planting materials for stormwater treatment (for landscape-based treatment measures) and should be designed with considerations for vector/mosquito control. Proposed planting materials for all proposed landscape-based stormwater treatment measures should be included on the landscape and irrigation plan for the project. The sponsor is not required to include on-site stormwater treatment measures in the post-construction stormwater management plan if he or she secures approval from an appropriate agency that an alternate approach is appropriate. The project sponsor can and should implement the approved stormwater management plan. **MM-W14:** SCAG shall continue to work with local jurisdictions and water agencies, to encourage regional-scale planning for improved stormwater management and groundwater recharge, including consideration of alternative recharge technologies and practices. Future adverse impacts shall be avoided through cooperative planning, information sharing, and comprehensive implementation efforts within the SCAG region. **MM-W15:** Project sponsors can and should consult with the RWQCB and Storm Water Management Plan permit holders as projects are designed to ensure that projects protect the goals of the Clean Water Act and comply with federal storm water NPDES permits. **MM-W16:** Project sponsors can and should ensure that new facilities include structural water quality control features such as drainage channels, detention basins, oil and grease traps, filter systems, and vegetated buffers to prevent pollution of adjacent water resources by polluted runoff where required by applicable urban storm water runoff discharge permits. **MM-W17:** Structural storm water runoff treatment can and should be provided according to the applicable urban storm water runoff permit where facilities will be operated by a permitted municipality or county. Where Caltrans is the operator, the statewide permit applies. **MM-W18:** Project sponsors can and should ensure that operational best management practices for street cleaning, litter control, and catch basin cleaning are implemented to prevent water quality degradation in compliance with applicable storm water runoff discharge permits. Efforts can and should be made to assure treatment controls are in place as early as possible, such as during the acquisition process for rights-of-way, not just later during the facilities design and construction phase. **MM-W19:** In compliance with applicable municipal separate storm sewer system discharge permits as well as Caltrans' storm water discharge permit, long-term sediment control can and should be affected through erosion control and revegetation	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	programs designed to allow reestablishment of native vegetation on slopes and undeveloped areas. **MM-W20:** Drainage of roadway runoff can and should comply with Caltrans' storm water discharge permit. Wherever possible, roadways can and should be designed to convey storm water through vegetated median strips that provide detention capacity and allow for infiltration before reaching culverts. **MM-W21:** Treatment and control features such as detention basins, infiltration strips, and porous paving, other features to control surface runoff and facilitate groundwater recharge can and should be incorporated into the design of new transportation projects early on in the process to ensure that adequate acreage and elevation contours are provided during the right-of-way acquisition process. **MM-W22:** Project sponsors can and should assure projects mitigate for changes to the volume of runoff, where any downstream receiving water body has not been designed and maintained to accommodate the increase in flow velocity, rate, and volume without impacting the water's beneficial uses. Pre-project flow velocities, rates, and volumes must not be exceeded. This applies not only to increases in storm water runoff from the project site, but also to hydrologic changes induced by flood plain encroachment. Projects should not cause or contribute to conditions that degrade the physical integrity or ecological function of any downstream receiving waters. **MM-W23:** Impacts can and should be reduced to the extent possible by providing culverts and facilities that do not increase the flow velocity, rate, or volume and/or acquiring sufficient storm drain easements that accommodate an appropriately vegetated earthen drainage channel. **MM-W24:** Project sponsors of improvement projects on existing facilities can and should include upgrades to stormwater drainage facilities to accommodate any increased runoff volumes. These upgrades may include the construction of detention basins or structures that will delay peak flows and reduce flow velocities, including expansion and restoration of wetlands and riparian buffer areas. System designs can and should be completed to eliminate increases in peak flow rates from current levels. **MM-W25:** Local jurisdictions can and should encourage Low Impact Development and incorporation of natural spaces that reduce, treat, infiltrate and manage stormwater runoff flows in all new developments, where practical and feasible. **MM-W26:** Project sponsor can and should ensure that for sites less than one acre, project drawings submitted for a building permit (or other construction-related permit) contain a final site plan to be reviewed and approved by the appropriate local agency. The final site plan should incorporate appropriate site design measures to manage stormwater runoff and minimize impacts to water quality after the construction of the project. These measures may include, but are not limited to, the following: • Minimize impervious surfaces, especially directly connected impervious surfaces; • Utilize permeable paving in place of impervious paving where appropriate; • Cluster buildings; • Preserve quality open space; and • Establish vegetated buffer areas. The approved plan should be implemented and the site design measures shown on the plan should be permanently maintained. **MM-W27:** Project sponsors can and should implement BMPs to reduce erosion, sedimentation, and water quality impacts during	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	construction to the maximum extent practicable. Plans demonstrating BMPs should be submitted for review and approval by the Lead Agency. At a minimum, the project sponsor can and should provide filter materials deemed acceptable to the Lead Agency at nearby catch basins to prevent any debris and dirt from flowing into the local storm drain system and creeks. **MM-W28:** Project sponsors for sites over one acre, must obtain coverage under the General Construction Activity Storm Water Permit (General Construction Permit) issued by the State Water Resources Control Board (SWRCB). The project sponsor must file a notice of intent (NOI) with the SWRCB. The project sponsor will be required to prepare a stormwater pollution prevention plan (SWPPP) and submit the plan for review and approval by the Lead Agency. At a minimum, the SWPPP should include a description of construction materials, practices, and equipment storage and maintenance; a list of pollutants likely to contact stormwater; site-specific erosion and sedimentation control practices; a list of provisions to eliminate or reduce discharge of materials to stormwater; BMPs, and an inspection and monitoring program. Prior to the issuance of any construction-related permits, the project sponsor should submit to the lead agency a copy of the SWPPP and evidence of submittal of the NOI to the SWRCB. Implementation of the SWPPP should start with the commencement of construction and continue though the completion of the project. After construction is completed, the project sponsor can and should submit a notice of termination to the SWRCB. **MM-W29:** Project sponsors can and should ensure that project drawings submitted for a building permit (or other construction-related permit) contain a drainage plan to be reviewed and approved by the appropriate agency. The drainage plan should include measures to reduce the post-construction volume and velocity of stormwater runoff to the maximum extent practicable. Stormwater runoff should not be augmented to adjacent properties or creeks. The drainage plan should include and identify the following: • All proposed impervious surface on the site; • Anticipated directional flows of on-site stormwater runoff; • Site design measures to reduce the amount of impervious surface area and directly connected impervious surfaces; • Source control measures to limit the potential for stormwater pollution; and • Stormwater treatment measures to remove pollutants from stormwater runoff. **MM-W30:** Project sponsors can and should submit an erosion and sedimentation control plan for review and approval by the appropriate government agency. All work should incorporate all applicable BMPs for the construction industry, including BMP's for dust, erosion and water quality. The measures should include, but are not limited to, the following: • On sloped properties, the downhill end of the construction area must be protected with silt fencing (such as sandbags, filter fabric, silt curtains, etc.) and hay bales oriented parallel to the contours of the slope (at a constant elevation) to prevent erosion into the street, gutters, stormdrains. • In accordance with an approved erosion control plan, the project sponsor should implement mechanical and vegetative measures to reduce erosion and sedimentation, including appropriate seasonal maintenance. One hundred (100) percent degradable erosion control fabric should be installed on all graded slopes to protect and stabilize the slopes during construction and before permanent vegetation gets established. All graded areas should be temporarily protected from erosion by seeding with fast growing annual species. All bare slopes must be covered with staked tarps when rain is occurring or is expected.	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	• Minimize the removal of natural vegetation or ground cover from the site in order to minimize the potential for erosion and sedimentation problems. Maximize the replanting of the area with native vegetation as soon as possible. • Install filter materials acceptable to the appropriate agency at the storm drain inlets nearest to the project site prior to the start of the wet weather season (October 15); site dewatering activities; street washing activities; saw cutting asphalt or concrete; and in order to retain any debris flowing into the storm drain system. Filter materials should be maintained and/or replaced as necessary to ensure effectiveness and prevent street flooding. • Ensure that concrete/granite supply trucks or concrete/plaster finishing operations do not discharge wash water into water courses, street gutters, or storm drains. • Direct and locate tool and equipment cleaning so that wash water does not discharge into the street, gutters, or stormdrains. • Create a contained and covered area on the site for storage of bags of cement, paints, flammables, oils, fertilizers, pesticides, or any other materials used on the project site that have the potential for being discharged to the storm drain system by the wind or in the event of a material spill. No hazardous waste material should be stored on-site. • Gather all construction debris on a regular basis and place them in a dumpster or other container which is emptied or removed on a weekly (or other interval approved by the Lead Agency) basis. When appropriate, use tarps on the ground to collect fallen debris or splatters that could contribute to stormwater pollution. • Remove all dirt, gravel, refuse, and green waste from the sidewalk, street pavement, and storm drain system adjoining the project site. During wet weather, avoid driving vehicles off paved areas and other outdoor work. • As appropriate, broom sweep the street pavement adjoining the project site on a daily basis. Caked-on mud or dirt should be scraped from these areas before sweeping. At the end of each workday, the entire site must be cleaned and secured against potential erosion, dumping, or discharge to the street, gutter, and/or stormdrains. • All erosion and sedimentation control measures implemented during construction activities, as well as construction site and materials management should be in strict accordance with the control standards listed in the latest edition of the Erosion and Sediment Control Field Manual published by the RWQB. All erosion and sedimentation control measures should be monitored regularly by the project sponsor. If measures are insufficient to control sedimentation and erosion then the project sponsor should develop and implement additional and more effective measures immediately	
Potential to reduce groundwater infiltration.	**MM-W31:** Project sponsors can and should ensure that projects requiring continual dewatering facilities implement monitoring systems and long-term administrative procedures to ensure proper water management that prevents degrading of surface water and minimizes, to the greatest extent possible, adverse impacts on groundwater for the life of the project. Construction designs can and should comply with appropriate building codes and standard practices including the Uniform Building Code. **MM-W32:** Project sponsors, lead agencies, and local jurisdictions can and should maximize, where practical and feasible, permeable surface area in existing urbanized areas to protect water quality, reduce flooding, allow for groundwater recharge, and preserve wildlife habitat. New impervious surfaces can and should be minimized to the greatest extent possible, including the use of in-lieu fees and off-site mitigation.	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	MM-W33: Project sponsors can and should avoid designs that require continual dewatering where feasible. **MM-W34:** Where feasible, transportation facilities can and should not be sited in groundwater recharge areas, to prevent conversion of those areas to impervious surface. **MM W35:** Project sponsors can and should reduce hardscape to the extent feasible to facilitate groundwater recharge as appropriate.	
Potential to increase flooding hazards, by placing projects on alluvial fans and within 100-year flood hazard areas.	**MM-W36:** Project sponsor can and should ensure that all roadbeds for new highway and rail facilities be elevated at least one foot above the 100-year base flood elevation. Since alluvial fan flooding is not often identified on FEMA flood maps, the risk of alluvial fan flooding should be evaluated and projects should be sited to avoid alluvial fan flooding. Delineation of floodplains and alluvial fan boundaries should attempt to account for future hydrologic changes caused by global climate change. **MM-W37:** Project sponsors of transportation improvements can and should comply with local, state, and federal floodplain regulations. Projects requiring federal approval or funding should comply with Executive Order 11988 on Floodplain Management, which requires avoidance of incompatible floodplain development, restoration and preservation of the natural and beneficial floodplain values, and maintenance of consistency with the standards and criteria of the National Flood Insurance Program. **MM-W38:** Local jurisdictions can and should, to the extent feasible and appropriate, prevent development in flood hazard areas that do not have appropriate protections, especially in alluvial fan areas of the region.	Significant and Unavoidable
Potential to exceed capacity of wastewater treatment services.	See Mitigation Measures **MM-W2** through **MM-7**.	Significant and Unavoidable
Potential to contribute to an increased demand for water supply and its associated infrastructure.	**MM-W39:** Local water agencies can and should continue to evaluate future water demands and establish the necessary supply and infrastructure to meet that demand, as documented in their Urban Water Management Plans. **MM-W40:** Project sponsors, local jurisdictions, and water agencies can and should include conjunctive use as a water management strategy when feasible. **MM-W41:** SCAG, in coordination with regional water agencies and other stakeholders, shall encourage the kind of regional coordination throughout California and the Colorado River Basin that develops and supports sustainable policies in accommodating growth. **MM-W42:** SCAG, in coordination with regional water agencies and other stakeholders, shall facilitate information sharing about the management and status of the Sacramento River Delta, the Colorado River Basin, and other water supply source areas of importance to local water supply. **MM-W43:** Regional water agencies can and should consider, to the greatest extent feasible, potential climate change hydrology and attendant impacts on available water supplies and reliability in the process of creating or modifying systems to manage water resources for both year-round use and ecosystem health. As the methodology and base data for such decisions is still developing, agencies can and should use the best currently available science in decision-making. Local	Significant and Unavoidable

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	jurisdictions and water agencies can and should rely on current regional analyses when making local decisions regarding future water supply and reliability. **MM-W44:** Project sponsors and local jurisdictions can and should reduce exterior uses of water in public areas, and should promote reductions in private homes and businesses, by shifting to drought-tolerant native landscape plantings (xeriscaping), using weather-based irrigation systems, educating other public agencies about water use, and installing related water pricing incentives. Local jurisdictions can and should also work with local retailers and vendors to promote the availability of drought resistant landscaping options and provide information on where these can be purchased. Use of reclaimed water especially in median landscaping and hillside landscaping can and should be implemented where feasible. **MM-W45:** Future impacts to water supply shall be minimized through cooperation, information sharing, and program development as part of SCAG's on-going regional planning efforts, in coordination with regional water agencies and other stakeholders. **MM-W46:** Project sponsors can and should coordinate with the local water provider to ensure that existing and/or planned water supply and water conveyance facilities are capable of meeting water demand/pressure requirements. In accordance with State Law, a Water Supply Assessment can and should be required for projects that meet the size requirements specified in the regulations. In coordination with the local water provider, each project sponsor will identify specific on- and off-site improvements needed to ensure that impacts related to water supply and conveyance demand/pressure requirements are addressed prior to issuance of a certificate of occupancy. Water supply and conveyance demand/pressure clearance from the local water provider will be required at the time that a water connection permit application is submitted. **MM-W47:** Project sponsors can and should coordinate with the local fire service provider in order to ensure that existing and/or planned fire hydrants are capable of meeting fire flow demand/pressure requirements. The issuance of building permits will be dependent upon submission, review, approval, and testing of fire flow demand and pressure requirements, as established by the local fire service provider prior to occupancy. **MM-W48:** Project sponsors can and should implement water conservation measures in new development that should include but not be limited to the following: • Installation of high-efficiency toilets (1.28 gallons per flush or less, includes dual flush. • High-efficiency urinals (0.125 gallons per flush or less, includes waterless) • Restroom faucet flow rate of 1.5 gallons per minute or less • Public restroom faucet flow rate of 0.5 gallons per minute or less and self-closing • Showerhead flow rate of 2.0 gallons per minute or less • Limit of one showerhead per shower stall • High efficiency clothes washers (water factor of 4.0 or less) • High efficiency dishwashers (Energy Star rated) • Domestic water heating system located in close proximity to point(s) of use, as feasible; use of tankless and on-demand water heaters as feasible • Cooling towers must be operated at a minimum of 5.5 cycles of concentration • Install on-site water recycling as feasible	

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Impact	Mitigation Measures	Significance After Mitigation
	• Use of recycled water (if available) for appropriate end uses (irrigation, cooling towers, sanitary) • Single pass cooling should be prohibited (e.g. any vacuum pumps or ice machines) • Irrigation should include: ▪ Weather-based irrigation controller with rain shutoff ▪ Flow sensor and master valve shutoff (for large landscaped areas) ▪ Matched precipitation (flow) rates for sprinkler heads ▪ Drip/microspray/subsurface irrigation where appropriate ▪ Minimum irrigation system distribution uniformity of 75% ▪ Proper hydro-zoning, turf minimization and use of native/drought tolerant plant materials ▪ Use of landscape contouring to minimize precipitation runoff **MM-W49:** Project sponsors can and should consult with the local water provider to identify feasible and reasonable measures to reduce water consumption, including, but not limited to, systems to use reclaimed water for landscaping, drip irrigation, re-circulating hot water systems, water conserving landscape techniques (such as mulching, installation of drip irrigation systems, landscape design to group plants of similar water demand, soil moisture sensors, automatic irrigation systems, clustered landscaped areas to maximize the efficiency of the irrigation system), water conserving kitchen and bathroom fixtures and appliances, thermostatically controlled mixing valves for baths and showers, and insulated hot water lines. **MM-W50:** Project sponsors can and should incorporate compliance with local drought measures as appropriate including prohibiting hose watering of driveways and associated walkways; requiring decorative fountains to use recycled water, and repairing water leaks in a timely manner. **MM-W51:** Project sponsors can and should incorporate automatic sprinkler systems that irrigate landscaping during morning hours or during the evening to reduce water losses from evaporation. Sprinklers should be required to reset to water less often in cooler months and during the rainfall season, so that water is not wasted in excessive landscape irrigation. **MM-W52:** Prior to issuance of building permits, project sponsors can and should pay any appropriate fees imposed by local water providers to off-set any fair share project costs as identified by the local water provider. **MM-W53:** As part of the general plan update process, local jurisdictions can and should coordinate with water providers to identify water budgets for development within their jurisdiction. Local water providers may provide for new water supply through a combination of water conservation (on and potentially off-site) and recycled water, such that the net increase in water demand (not including demand for recycled water) does not exceed the calculated demand anticipated in the most recent Urban Water Management Plan or other similar document. **MM-W54:** Project sponsors can and should create water-efficient landscapes. **MM-W55:** Project sponsors can and should install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls and use water-efficient irrigation methods. **MM-W56:** Project sponsors can and should incorporate water-reducing features into building and landscape design. **MM-W57:** Project sponsors should make effective use of graywater for landscape irrigation. (Graywater is untreated household wastewater from bathtubs, showers, bathroom wash basins, and water from clothes washing machines.)	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	MM-W58: Project sponsors can and should implement low-impact development practices that maintain the existing hydrology of the site to manage storm water and protect the environment by doing the following: • Devise a comprehensive water conservation strategy appropriate for the project and location. • Design buildings to be water-efficient. Install water-efficient fixtures and appliances. • Offset water demand from new projects so that there is no net increase in water use. • Provide education about water conservation and available programs and incentives. **MM-W59:** Local jurisdictions can and should adopt and implement a comprehensive strategy to increase water conservation and the use of recycled water that includes similar measure to the following: • **Water Consumption Reduction Target:** Regional water agencies should work together to set a target for to reduce per capita water consumption by 2020. • **Water Conservation Plan:** Regional water agencies should establish a water conservation plan that may include such policies and actions as: ▪ Tiered rate structures for water use; ▪ Restrictions on time of use for landscape watering, and other demand management strategies; ▪ Performance standards for irrigation equipment and water fixtures; ▪ Requirements that increased demand from new construction be offset with reductions so that there is no net increase in water use. • **Recycled Water Use:** Local jurisdictions and regional water agencies should establish programs and policies to increase the use of recycled water, including: ▪ Create an inventory of non-potable water uses within the jurisdiction that could be served with recycled water; ▪ Produce and promote the use of recycled water for agricultural, industrial, and irrigation purposes, including grey water systems for residential irrigation; ▪ Produce and promote the use of treated, recycled water for potable uses where GHG emissions from producing such water are lower than from other potable sources. • **Water Conservation Outreach:** Local jurisdictions and regional water agencies should implement a public education and outreach campaign to promote water conservation, and highlights specific water-wasting activities to discourage, such as the watering of non-vegetated surfaces and using water to clean sidewalks and driveways. **MM-W60:** Local jurisdictions can and should ensure that building standards and permit approval processes promote and support water conservation. **MM-W61:** Local jurisdictions can and should establish building design guidelines and criteria to promote water-efficient building design, including minimizing the amount of non-roof impervious surfaces around the building(s). **MM-W62:** Local jurisdictions can and should establish menus and check-lists for developers and contractors to ensure water-efficient infrastructure and technology are used in new construction, including low-flow toilets and shower heads, moisture-sensing irrigation, and other such advances. **MM-W63:** SCAG, in coordination with the State Water resources Board, shall encourage cities, counties and water districts to develop local sources of potable water including recycling where feasible. **MM-W64:** Local jurisdictions can and should establish criteria and standards to permit the safe and effective use of gray water (on-	

TABLE ES-1: SUMMARY OF THE 2012-2035 RTP/SCS IMPACTS

Impact	Mitigation Measures	Significance After Mitigation
	site water recycling), and review and appropriately revise, without compromising health and safety, other building code requirements that might prevent the use of such systems. **MM-W65:** Local jurisdictions can and should establish programs and policies to ensure landscaping and forests are installed and managed to optimize their climate benefits. **MM-W66:** Project sponsors can and should install water efficient landscapes and irrigation, including: • Planting drought-tolerant and native species, and covering exposed dirt with moisture-retaining mulch; • Installing water-efficient irrigation systems and devices, including advanced technology such as moisture-sensing irrigation controls; and/or • Installing edible landscapes that provide local food. **MM-W67:** SCAG, as part of its on-going outreach and technical assistance efforts, shall organize workshops on water conservation activities, such as selecting and planting drought tolerant, native plants in landscaping, and installing advanced irrigation systems. **MM-W68:** Regional water agencies can and should maximize efficiency at drinking water treatment, pumping, and distribution facilities, including development of off-peak demand schedules for heavy commercial and industrial users.	
Potential to contribute to cumulatively considerable demand on water resources.	**MM-W1** through **MM-W68** would address cumulative water impacts.	Significant and Unavoidable

SOURCE: TAHA, 2011.

1.0 INTRODUCTION

SUMMARY

The Southern California Association of Governments (SCAG) prepared this Program Environmental Impact Report (PEIR), pursuant to the California Environmental Quality Act (CEQA), for the 2012-2035 Regional Transportation Plan and Sustainable Communities Strategy (2012-2035 RTP/SCS, Plan or Project). The 2012-2035 RTP/SCS is a long-range regional transportation plan that provides a blueprint to help achieve a coordinated regional transportation system by creating a vision for transportation investment throughout the region and identifying regional transportation and land use strategies to address mobility needs. The 2012-2035 RTP/SCS includes a policy element that is shaped by goals, policies and performance indicators, an action element that identifies specific projects, programs and implementation, and a description of regional growth trends that identifies future needs for travel and goods movement. The PEIR for the 2012-2035 RTP/SCS serves as an informational document to inform decision-makers and the public of the potential environmental consequences of approving the proposed Plan. The PEIR includes mitigation measures designed to help avoid or minimize significant environmental impacts.

Individual transportation projects are preliminarily identified in the 2012-2035 RTP/SCS; however, this PEIR analyzes potential environmental impacts from a regional perspective and is programmatic in nature. As such, it does not specifically analyze these individual projects. Project-specific planning and implementation undertaken by each implementing agency will depend on a number of issues, including: policies, programs and projects adopted at the local level; restrictions on federal, State and local transportation funds; the results of feasibility studies for particular corridors; and further environmental review of proposed projects. Project-specific analysis will be undertaken by the appropriate implementing agency prior to individual projects being considered for adoption.

For purposes of analysis, SCAG has developed a land use distribution pattern and land use scenarios to address actions and strategies included in the Sustainable Communities Strategy (SCS) portion of the 2012-2035 RTP/SCS. This PEIR programmatically analyzes this land use distribution pattern (as part of the project analysis) as well as alternative land use distribution patterns (in the alternatives chapter).

Although not required to do so, local jurisdictions are encouraged by SCAG to consider the proposed actions and Strategies provided in Chapter 4: Sustainable Communities Strategy, of the Plan including strategies addressing land use, the transportation network, Transportation Demand Management (TDM), Transportation Systems Management (TSM) and clean vehicle technology.

SCOPE AND METHODOLOGY

This PEIR fulfills the requirements of CEQA. It is a programmatic document that provides a region-wide assessment of the potential significant environmental effects of implementing the projects, programs and policies included in the 2012-2035 RTP/SCS (including the new SCS portion of the Plan). A PEIR "may be prepared on a series of actions that can be characterized as one large project and are related either: (1) geographically, (2) as logical parts of the chain of contemplated actions, (3) in connection with issuance of rules, regulations, plans or other general criteria to govern the conduct of a continuing program, or (4) as individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways." (CEQA Guidelines §15168). A PEIR provides a regional consideration of cumulative effects and includes broad policy

alternatives and program mitigation measures that are equally broad in scope. This PEIR provides a regional scale analysis and a framework of mitigation measures for subsequent, site-specific environmental review documents prepared by lead agencies in the region as individual planning, development and transportation projects are identified, designed and move through the planning, review and decision-making process.

A PEIR may serve as a first-tier document for later CEQA review of individual projects included in the program. These project-specific CEQA reviews will focus on project-specific impacts and mitigation measures, and need not repeat the broad analyses contained in the PEIR. As discussed by the California Supreme Court, "it is proper for a lead agency to use its discretion to focus a first-tier EIR on only the…program, leaving project-specific details to subsequent EIRs when specific projects are considered." (*In re Bay Delta* (2008) 43 Cal. 4th 1143, 1174).

As such, the focus of the environmental analysis in the PEIR is on regional-scale and cumulative impacts of implementation of the Plan and the alternatives. The long-range planning horizon of more than 20 years necessitates that many of the highway, arterial goods movement, and transit projects included in the Plan (and the alternatives) are identified at the conceptual level. This document addresses environmental impacts to the level that they can be assessed without undue speculation (CEQA Guidelines § 15145). This PEIR acknowledges this uncertainty and incorporates these realities into the methodology to evaluate the environmental effects of the Plan, given its long term planning horizon.

The degree of specificity in an EIR corresponds to the degree of specificity of the underlying activity being evaluated (CEQA Guidelines §15146). Also, the adequacy of an EIR is determined in terms of what is reasonably feasible, in light of factors such as the magnitude of the project at issue, the severity of its likely environmental impacts, and the geographic scope of the project (CEQA Guidelines §§15151, 15204(a).). The activity being evaluated in this PEIR is the long-term Regional Transportation Plan (RTP) including the Sustainable Communities Strategy (SCS). This Draft PEIR strives to provide as much quantitative detail as feasible regarding the regional environmental impacts of the Plan. Not all impacts can be feasibly and/or accurately quantitatively analyzed at a regional level and/or up to the year 2035.

CEQA Guidelines §15146(b) provides that an EIR prepared for the adoption of a local general plan should focus on the secondary environmental effects to be expected following adoption, but that the EIR need not be as detailed as one prepared for the specific construction projects that follow. Further, CEQA Guidelines §15152(c) state that when a lead agency is using the tiering process for a large scale planning approval such as a general plan, the development of detailed site-specific information may not be feasible and can be deferred to project-specific CEQA documents. Since the 2012-2035 RTP/SCS is even broader in scope and has a longer time horizon than many general plans, such detail is not required.

The geographic scope and complexity of the 2012-2035 RTP/SCS played an important role in determining the appropriate level of detail to include in this PEIR. The SCAG region encompasses more than 38,000 square miles and includes six counties, 14 subregional entities and 191 cities. The SCAG region has more than 18 million residents. As a result, the 2012-2035 RTP/SCS is very complicated and highly diverse, consisting of many transit, highway, and phased arterial projects, as well as a comprehensive SCS.

Potential significant environmental effects of the 2012-2035 RTP/SCS were identified by employing multiple analytical methods, including spatial analysis, transportation, noise, land use and air quality modeling and other quantitative, ordinal and qualitative techniques. Spatial analysis using Geographic Information Systems (GIS) was employed to evaluate the potential effects of the major freeway, rail and transit projects on resource categories such as land use, biological/open space and water resources. Transportation, noise and air quality simulation models were used to estimate the transportation, noise and air quality impacts. Project and policy elements of the 2012-2035 RTP/SCS and alternatives were incorporated into the modeling analysis and the socioeconomic projections. The specific techniques used to

evaluate each potential environmental effect are described in each resource/issue section in Chapter 3.0 of this document.

BASELINE FOR DETERMINING SIGNIFICANCE

The PEIR must identify significant impacts that would be expected to result from implementation of the 2012-2035 RTP/SCS. Significant impacts are defined as a "substantial or potentially substantial, adverse change in the environment" (Public Resources Code § 21068). Significant impacts must be determined by applying explicit significance criteria to compare the future Plan conditions to the existing environmental setting (CEQA Guidelines § 15126.2(a)). The existing setting is described in detail in each resource section of Chapter 3.0 of this document, and represents the most recent, reliable, and representative data to describe current regional conditions. The criteria for determining significance are also included in each resource section in Chapter 3.0 of this document.

THRESHOLDS OF SIGNIFICANCE

CEQA gives the lead agency the responsibility to determine whether an adverse environmental effect identified in an EIR should be classified as "significant" or "less than significant." (CEQA Guidelines § 15064(b).) Under Section 15064(b), "the significance of an activity may vary with the setting" and, as a result, an inflexible definition of what constitutes a significant effect is not always possible. The lead agency has discretion to set its own significance criteria, which requires the lead agency to make a policy judgment about how to distinguish impacts which are adverse, but significant, from impacts which are adverse, but not significant. *(Eureka Citizens for Responsible Gov't v City of Eureka (2007) 147 Cal.App.4th 357).* A lead agency may select a standard of significance based on its judgment about an appropriate standard of significance (*Sierra Club v. City of Orange (2008) 163 Cal.App.4th 523, 541).* The standards of significance used in an EIR may also rely upon policies adopted and implemented by the lead agency *(Mira Mar Mobile Community v. City of Oceanside (2004) 119 Cal.App.4th 477).*

COMPARISON WITH THE NO PROJECT ALTERNATIVE

It is important to emphasize that the urbanization in the SCAG region will increase substantially by 2035, with or without implementation of the 2012-2035 RTP/SCS. The CEQA required environmental baseline of current conditions means that the impact assessment for many of the resource categories is cumulative in nature. Therefore, the analysis for each resource category also includes a direct comparison between the expected future conditions with the Plan and the expected future conditions if no Plan were adopted. This evaluation is not included in the determination of significant impacts; however, it provides a meaningful perspective on the effects of implementing the 2012-2035 RTP/SCS. A direct comparison between the Plan and the No Project Alternative (described below) is included in each resource section of Chapter 3.0 of this document.

PROPOSED RTP/SCS AND ALTERNATIVES TO THE RTP/SCS

When considering whether or not the range of alternatives to be evaluated in an EIR is adequate, several principles apply. The "discussion of alternatives need not be exhaustive," and the requirement to discuss alternatives is "subject to a construction of reasonableness." (*Residents Ad Hoc Stadium Committee v. Board of Trustees (1979) 89 Cal.App.3d 274, 286*.) "An EIR need not consider every conceivable alternative to a project." (CEQA Guidelines §15126.6(a))

Under CEQA, perfection is not the standard governing a lead agency's proposed range of project alternatives. Rather, in preparing an EIR, a lead agency must make an objective, good faith effort to provide information permitting a reasonable choice of alternatives that would feasibly attain most of the basic objectives of the project, while avoiding or substantially lessening the project's significant adverse environmental impacts. (*California Oak Foundation v. Regents of University of California (2010) 188 Cal.App. 4th 227, 275-276.)*

This Draft PEIR evaluates a reasonable range of alternatives to the 2012-2035 RTP/SCS that brackets the range of potential impacts that could occur under a spectrum of changes to individual components of the 2012-2035 RTP/SCS. These alternatives are briefly described below. More detailed information about each of these alternatives is presented in Chapter 4.0.

1. The **Proposed 2012-2035 RTP/SCS** provides land use and transportation recommendations to help achieve a coordinated balance of land uses and transportations such that vehicle trips and vehicle trip lengths are reduced and land is used efficiently and sustainably, thereby minimizing energy and water consumption. The 2012-2035 RTP/SCS contains transportation and urban form strategies that encourage compact growth, increased jobs/housing balance and transit-oriented development, where feasible, in all parts of the region. The 2012-2035 RTP/SCS is described in the Project Description (Chapter 2.0).

2. The **No Project Alternative** includes only those transportation projects that are included in the first year of the previously conforming transportation plan and/or Transportation Improvement Plan (TIP), or have completed environmental review by December 2010. The No Project Alternative also includes projects undergoing right-of-way acquisition or under construction. These reasonably foreseeable projects fulfill the definition of the mandated CEQA No Project Alternative (CEQA Guidelines § 15126.6(e)).

3. The **2008 Modified RTP Alternative** is an update of the adopted 2008 RTP to reflect the most recent growth estimates and transportation planning decisions and assumptions. This alternative does not include the urban form strategies included within the 2012-2035 RTP/SCS.

4. The **Envision 2 Alternative** builds on the enhanced density and transit orientation of the SCS and goes further. It includes more aggressive densities than the 2012-2035 RTP/SCS and limits the single-family housing that would be built in the region.

The Plan and each alternative maintain a constant total for population, households and jobs for the region in 2035. The year 2035 growth projections for each alternative differ only in the distribution of people, households and jobs such that some counties have higher totals for a given alternative while other counties will have lower totals. The alternatives differ in terms of this distribution because the different transportation investments and urban form strategies would be expected to support different regional distributions of population, households and employment.

CEQA Guidelines (§15126.6(d)) require an EIR to include sufficient information about each alternative in order to allow meaningful evaluation, analysis, and comparison with the proposed project. They suggest the

use of a matrix displaying each alternative's significant environmental effects to summarize the comparison (see Chapter 4). When a large-scale program contains multiple, interrelated objectives, an alternative that does not meet all of those objectives may be excluded from detailed analysis. (See *In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* (2008) 43 Cal. 4th 1143, 1162–1168.) An EIR must discuss alternatives to a project in its entirety, but is not required to discuss alternatives to each particular component of a project. (See *California Oak Foundation v. Regents of University of California* (2010) 188 Cal.App. 4th 227, 276-277.) CEQA does not require an EIR to consider multiple variations on the alternatives analyzed. "What is required is the production of information sufficient to permit a reasonable choice of alternatives so far as environmental aspects are concerned." (*Village Laguna of Laguna Beach, Inc. v.21 Board of Supervisors of Orange County* (1982) 134 Cal.App.3d 1022.)

GROWTH PATTERNS

The 2012-2035 SCS/RTP includes an SCS that encourages a more compact landform, with growth focused at transit nodes, centers and in areas designed to balance out the ratio of jobs to housing. This growth pattern results in substantially less consumption of vacant, open space/recreation and agricultural land (334 square miles or 213,800 acres under the Plan compared to up to 742 square miles or 474,900 acres under the No Project condition) compared to the No Project (referred to as Baseline growth forecast, in the 2012-2035 RTP/SCS). This PEIR analyzes the impacts of the 2012-2035 RTP/SCS growth forecast as well as the No Project growth forecast in addition to impacts from the 2012-2035 RTP/SCS transportation projects.

Analysis of the land use distribution pattern (and alternate land use scenarios) necessarily includes analysis of the growth distribution and anticipated land use development necessary to accommodate the growth. However, because locations, densities, orientation timing and other site sensitive factors related to development are not specified in the Plan, SCAG cannot reliably quantify the impacts from such anticipated development. SCAG can nevertheless programmatically analyze these impacts and provide mitigation measures to address them

If 2012-2035 RTP/SCS transportation projects were combined with the No Project growth forecast, impacts would fall within the range of impacts analyzed in this document, or in the case of some of the modeled parameters (traffic, noise, air quality) within the error margins (estimated to be anywhere between 5 percent and 15 percent) of the analytical tools (GIS and computer models) used to prepare the analyses contained herein.

MITIGATION MEASURES

General Description and Legal Requirements

Mitigation Measures proposed in this PEIR can be incorporated as policies in the Final 2012-2035 RTP/SCS and will help ensure that feasible mitigation measures are implemented at the project level. The implementing agencies and local lead agencies shall be responsible for ensuring adherence to the mitigation measures as 2012-2035 RTP/SCS projects are considered for approval over time. Lead agencies shall provide SCAG with documentation of compliance with mitigation measures through SCAG's monitoring efforts, including SCAG's Intergovernmental Review (IGR) process.

In general, the terms "local agency," "project sponsor" and "project implementing agency" are used throughout this PEIR to identify agencies, organizations, companies and individuals that will act as lead agencies or project applicants for different types of individual projects. Individual projects that are

anticipated to occur pursuant to the 2012-2035 RTP/SCS consist of planning projects (general plans, specific plans, climate action plans, etc.), development projects (including Transit Priority Projects (TPPs) and other similar projects), and transportation projects.

In general, "local agency" is used to refer to a public agency that would propose a planning project or a public infrastructure project and/or an agency that would be lead agency for individual projects. "Project sponsor" is typically used to refer to an applicant (that could be public or private, an organization or an individual) that proposes a project. "Project implementing agency" is used to refer to an agency responsible for implementing a project. In this document, project-implementing agencies are those that are responsible for carrying out (reviewing, approving, constructing) transportation projects.

This PEIR represents a region-wide assessment of existing conditions and potential impacts associated with implementation of the 2012-2035 RTP/SCS. As such, this PEIR identifies programmatic mitigation that would be implemented by SCAG or other agencies with broad-scale planning jurisdiction. Mitigation measures are stated as "SCAG shall" and "other local agencies (project sponsors, implementing agencies) can and should."

CEQA provides that an EIR can include feasible mitigation measures that are within the responsibility and jurisdiction of another agency. The appropriate CEQA finding in such instances is that such mitigation measures have been or "can and should be" adopted. (Public Resources Code §21081(a)(2); CEQA Guidelines §15092(a)(2).) When this finding is made, there is no further requirement that SCAG find that mitigation measures that are within the responsibility and jurisdiction of another agency have been incorporated into the project. That latter finding is reserved for mitigation measures within SCAG's responsibility and jurisdiction. Nevertheless, it is reasonable to expect that the other agencies will actually implement the mitigation measures assigned to them (see discussions below of transportation and land use planning and development projects).

Since mitigation measures are an important component of any EIR, they are subject to the same rules regarding level of detail appropriate to the EIR being prepared. In this case, the 2012-2035 RTP/SCS PEIR addresses a large-scale region with a variety of projects spread over more than 20 years. This Draft PEIR presents program-wide mitigation measures that largely will be implemented by SCAG and other agencies in subsequent project-specific design, CEQA review, and decision-making processes. As authorized by the CEQA Guidelines and case law, the mitigation measures included in this Draft PEIR are less detailed than those that would be part of a project EIR and the selection of detailed mitigation measures is properly deferred to future project-specific CEQA reviews.

While the Draft PEIR strives to provide as much detail as possible in the mitigation measures, some flexibility must be maintained to present mitigation approaches for impacts occurring over a large geographic scope and caused by a wide variety of transportation and land use activities. CEQA case law provides that a first-tier EIR may contain generalized mitigation criteria. (See, e.g., *Koster v. County of San Joaquin (1996) 47 Cal.App.4th 29*.)

CEQA case law has also held that deferral of the specifics of mitigation is permissible where the lead agency commits itself to mitigation and, in the mitigation measure, either describes performance standards to be met in future mitigation or provides a menu of alternative mitigation measures to be selected from in the future. (*California Native Plant Society v. City of Rancho Cordova* (2009) 172 Cal.App.4th 603 [the details of exactly how the required mitigation and its performance standards will be achieved can be deferred pending completion of a future study]; *Endangered Habitats League Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 793 [deferred mitigation acceptable when performance standards are included]; see also, *Riverwatch v. County of San Diego* (1999) 76 Cal.App.4th 1428, 1448-1450 [a deferred approach may be appropriate where it is not reasonably practical or feasible to provide a more complete analysis before approval and the EIR otherwise provides adequate information of the project's impacts]; *Sacramento Old*

City Assn. v. City Council of Sacramento, supra, 229 Cal.App.3d at p. 1028-1029 [deferral of agency's selection among several alternatives based on performance criteria was appropriate]).

This Draft PEIR presents regional performance measures for some mitigation measures, e.g., transportation. For many others, e.g., biological resource mitigation measures, selection of appropriate project-specific performance standards is appropriately deferred to project-specific CEQA documents, since the circumstances of individual transportation and land use projects will vary widely.

Transportation Project Mitigation

SCAG has limited authority to approve individual second-tier transportation network improvement projects in the RTP. Most individual transportation projects in the RTP will be implemented by Caltrans, county transportation commissions, local transit agencies, and local governments. These agencies routinely implement the types of mitigation measures identified in this Draft PEIR during project design, CEQA review, and/or project construction. This Draft PEIR has made a preliminary determination that the proposed mitigation measures are feasible and effective. Therefore, it is reasonable to expect that these agencies will actually implement them.

Land Use Planning and Development Project Mitigation

SCAG has no authority to adopt local land use plans or approve local land use projects that will implement the SCS. As described in the section below, SB 375 specifically provides that nothing in SB 375 supersedes the land use authority of cities and counties. In addition, cities and counties are not required to change their land use plans and policies, including general plans, to be consistent with an RTP/SCS. (Government Code §65080(b)(2)(K). Local governments are the main agencies responsible for mitigation of the impacts of land use plans and projects that implement the RTP/SCS, and SCAG has no concurrent authority to mitigate the impacts of land use plans and projects. Local governments routinely implement the types of mitigation measures identified in this Draft PEIR during project design, CEQA review, and/or project construction. This Draft PEIR has made a preliminary determination that these mitigation measures are feasible and effective. Therefore, it is reasonable to expect that local governments will actually implement them.

RTP/SCS PUBLIC PARTICIPATION PROCESS

In compliance with federal and state requirements, SCAG uses a Public Participation Plan to guide effective public involvement in developing its regional transportation plans and programs. The Public Participation Plan provided the direction for public engagement activities related to the development of the 2012-2035 RTP/SCS. The Public Participation Plan outlines the processes and strategies SCAG uses to reach out to a broad range of stakeholders and gain their input. SCAG's Public Participation Plan was amended in 2009 (Amendment No. 2) primarily to address new public participation requirements of SB 375. A third amendment to the Public Participation Plan is scheduled for adoption by the SCAG Regional Council in January 2012, and intended to provide minor revisions and clarifications related to the detailed outreach activities of the 2012-2035 RTP/SCS.

The Public Participation Plan identifies numerous activities to help SCAG ensure that the public has ready access to information and materials, as well as opportunities to provide feedback during the development of regional plans and programs. A large number of outreach materials were produced throughout the development of the Draft 2012-2035 RTP/SCS, including PowerPoint presentations, fact sheets, surveys, brochures, and maps. The SCAG website was enhanced to include an interactive RTP/SCS component, with easily accessible content.

From January through March 2011, SCAG conducted eleven (11) Subregional Planning Sessions with local cities and the County Transportation Commissions to gather input on projected population, household and employment growth throughout the region. Using this input, SCAG developed four planning scenarios for presentation and discussion at a series of 18 public workshops held between June and September of 2011. These RTP/SCS workshops were held throughout the SCAG region, with over 700 residents, elected officials, representatives of public agencies, community organizations, and environmental, housing and business stakeholders in attendance. At each workshop, participants engaged in discussions of objectives and priorities for the Draft 2012-2035 RTP/SCS, addressing a variety of issues including mobility, environment, health, modes of travel, the economy, safety, equity, and housing.

SCAG also broadened its participation activities in the development of the Draft 2012-2035 RTP/SCS to engage a more extensive group of stakeholders in its planning and programming processes. SCAG held Environmental Justice workshops in June 2010 and June 2011with approximately 30 and 60 participants in attendance, respectively. The participants included residents and representatives of local community organizations, as well as federal and state agencies. These workshops provided SCAG with valuable insight on important community issues such as gentrification and health impacts near transportation corridors during the planning stage of the Draft 2012-2035 RTP/SCS. SCAG also utilized a managed Wiki website to allow bicycle advocacy groups, county transportation officials and other stakeholders to author and provide direct feedback on a key component of the Draft 2012-2035 RTP/SCS — the Active Transportation Plan. As of November 2011, the Bicycle/Pedestrian Wiki has over 1,000 registered users and has received approximately 100 comments during the planning process.

In addressing the requirements of SAFETEA-LU, SCAG has expanded its overall public outreach strategy to include a broader and more diverse range of stakeholders. Current stakeholders include, but are not limited to, bicycle users and advocates; citizens; educational institutions; environmental groups; ethnic and minority groups; freight shippers; freight transportation service providers; non-profit organizations; older and retired persons; pedestrians; businesses; private transportation providers; public transit users; representatives of the disabled; special-interest non-profit agencies; transportation advocates; urban and rural advocacy groups; Native American tribes; and women's organizations. SCAG has endeavored to ensure that the voices of traditionally underrepresented and/or underserved audiences are heard during the development of the Draft 2012-2035 RTP/SCS. In addition, on November 30, 2011, SCAG staff held a Resource Agency Consultation Workshop attended by representatives from U.S. Environmental Protection Agency, National Resources Defense Council, local public agencies, environmental groups and public health agencies. This workshop focused on the proposed environmental mitigation program for this Plan, how the 2012-2035 RTP/SCS will address environmental justice and Title VI requirements, and the extent to which public health issues are being discussed in the 2012-2035 RTP/SCS.

The Draft 2012-2035 RTP/SCS was released by the Regional Council on December 1, 2011. SCAG plans to engage in additional public participation activities during the 55-day public review and comment period on the Draft RTP/SCS, which commenced on December 20, 2011 (after the full Draft RTP/SCS with appendices was released). To help further inform the region's stakeholders on the elements of the 2012 Draft RTP/SCS, SCAG has posted announcements and videos on its website, blog sites, and its social networking pages (Facebook, Twitter); prepared factsheets and other outreach materials in English, Spanish and Chinese; placed ads and public service announcements in newspapers, government access cable television stations, and e-newsletters; and sent announcements of public presentations to media, including the ethnic press.

During January and February 2012, SCAG will hold two workshops and one public hearing in each county within the region. Although the informational workshops will be targeted towards public officials and agency representatives, they will be open to the public and time will be allowed for public comment. SCAG will also conduct additional outreach activities to the business community, ethnic groups, Native American tribes, and other stakeholders during the public review period. SCAG will use its videoconferencing technology to enable more people to participate in presentations and meetings, as applicable.

With the release of the 2012-2035 Draft RTP/SCS, SCAG will unveil a new interactive RTP/SCS website that provides for easy navigation through the various sections of the Plan and allows visitors to submit comments from almost any page of the site. SCAG will continue to accept public input through mailings, email correspondence, and at presentations and meetings.

Comments received during the 55-day public review period of the 2012-2035 Draft RTP/SCS will be considered and included along with SCAG's responses to comments in the 2012-2035 Final RTP/SCS document. In addition, the 2012-2035 Draft RTP/SCS PEIR is being released for a 45-day public comment period. Formal written responses will be prepared and incorporated into the Final PEIR to address all written comments submitted on the PEIR.

Public engagement and participation have become an organizational-wide valued activity, and SCAG is committed to continually evaluate its strategies and approaches to enhance public participation. For more information on the Public Participation Plan and public comments, please see Chapter 6 of the 2012Draft RTP/SCS and Appendix XVI.

ENVIRONMENTAL REVIEW PROCESS

Pursuant to CEQA Guidelines § 15082, the Notice of Preparation (NOP) for the 2012-2035 RTP/SCS was released on May 10, 2011 and circulated for a 30-day comment period ending June 8, 2011. SCAG convened two PEIR scoping meetings at SCAG's regional offices on May 26, 2011 (2:00 p.m. to 4:00 p.m. and 4:00 p.m. to 6:00 p.m.). A copy of the NOP is included in Appendix A, along with copies of letters received in response to the NOP. SCAG received 24 written comments on the NOP.

CEQA STREAMLINING AND SB 375

SB 375 amends CEQA to add Chapter 4.2 Implementation of the Sustainable Communities Strategy, which allows a CEQA exemption for Sustainable Community Projects, as well as streamlined CEQA analysis for Transit Priority Projects (TPPs) and certain residential or mixed-use projects.

The purpose of the SCS is to develop strategies to meet the GHG emission reduction targets for the region, and qualifying projects that are consistent with the SCS will help meet this goal. Furthermore, because the potential impacts of the SCS are analyzed in this PEIR, the qualifying projects may take advantage of the CEQA streamlining provisions contained in SB 375. The intent of the CEQA streamlining provisions is not to undercut or circumvent CEQA requirements, but rather to reduce documentation and redundancy and to provide an incentive to support residential and transportation projects that are consistent with a larger effort to reduce GHG emissions. For more information on the CEQA incentive, please see Chapter 4, Sustainable Communities Strategy, of the Draft 2012-2035 RTP/SCS.

The following is a summary of the CEQA streamlining provisions in SB 375.

Transit Priority Project

A TPP is eligible for four types of CEQA relief: (1) Sustainable Communities Project CEQA Exemption; (2) Sustainable Communities Environmental Assessment, or (3) a streamlined EIR, or (4) traffic mitigation measures. Different types of CEQA relief are associated with different criteria that are to be met.

As a threshold matter, to qualify as a TPP, a project must be consistent with the general use designation, density, building intensity and applicable policies in a Sustainable Communities Strategy (SCS) accepted by the State Air Resources Board. The TPP must also:

- Be at least 50 percent residential use based on area;
- Contain at least 20 dwelling units/acre;
- Have a floor area ratio for the commercial portion of the project at 0.75, if the project contains between 26 percent and 50 percent nonresidential uses; and
- Be within 0.5 miles of a major transit stop[1] or high-quality transit corridor[2] included in the RTP.

(1) Sustainable Communities Project Exemption

The Sustainable Communities Project (SCP) is a TPP, which is consistent with the SCS that meets the following criteria:

i. The project and approved projects can be served by utilities, and project will pay applicable in-lieu or development fees;
ii. Does not include wildlife habitat of significant value or protected species;
iii. Is not contaminated (site is not on Cortese list);
iv. Site is subject to preliminary endangerment assessment regarding potential exposure to health hazards from nearby activities. Any hazards are to be mitigated to less than significant;
v. Would not significantly effect an historic resource;
vi. The site is not subject to wildland fire hazard, unusually high risk of fire/explosion from materials on adjacent properties, health hazard, seismic risk, landslide, or flood plain;
vii. The site is not located on developed open space; and
viii. The project would be 15 percent more-efficient than Title 24 and landscaping would use 25 percent less water than the regional average household;

In addition the project must meet the following:

1. The site is not more than 8 acres;
2. The project does not contain more than 200 units;
3. The project does not result in the net loss of affordable housing;
4. No single level building that exceeds 75,000 square feet;
5. Applicable mitigation, performance standards, criteria from prior EIRs will be incorporated in to the TPP;
6. Project would not conflict with nearby operating industrial use; and
7. Project is located within 0.5 miles of rail transit station, ferry terminal included in RTP or 0.25 miles of high quality transit corridor.

The project must meet at least one of the following:

a) At least 20 percent of the housing will be for moderate income or 10 percent rented to low income, or not less than 5 percent rented to very low income, and developer provides commitment to ensure continued availability to these income groups for the period;

[1]Defined as a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.

[2]Defined as a corridor with fixed route bus service with 15-minute service intervals during peak commute hours.

b) Developer pays in-lieu fees pursuant to local ordinance to result in an equivalent number of units that would otherwise be required in a) above; and
c) Project provides public open space 5 acres/1,000 residents.

After a public hearing where a legislative body finds that a TPP meets all the requirements, a project can be declared to be an SCP and can be exempted from CEQA.

(2) Sustainable Communities Environmental Assessment

A TPP that does not meet the Sustainable Communities Project Exemption may nevertheless qualify for a Sustainable Communities Environmental Assessment (SCEA) if the project incorporates all feasible mitigation measures, performance standards, or criteria set forth in prior applicable certified environmental impact reports (including the RTP/SCS PEIR)(Pub. Res. Code § 21155.2(b)). An SCEA is comparable to a negative declaration since the lead agency must find that all potentially significant impacts of a project have been identified, adequately analyzed, and mitigated to a level of insignificance. However, unlike a negative declaration, the SCEA need not consider the cumulative effects of the project that have been adequately addressed and mitigated in prior EIRs. Also, growth-inducing impacts are not required to be referenced, described or addressed. Additionally, project specific or cumulative impacts from cars and light duty truck trips on global warming or the regional transportation network need not be referenced, described or discussed.

The SCEA will be circulated for 30 days; comments will be considered; and then the SCEA may be approved after a public hearing provided impacts are mitigated. The SCEA will be reviewed under the substantial evidence standard, which means a court will uphold an agency's decision if there is substantial evidence in light of the whole record to support its action. This is different from the normal CEQA fair argument standard, which is less deferential and states that an EIR must be prepared when after examining the entire record, there is substantial evidence to support a fair argument that the project may have a significant effect on the environment. The substantial evidence standard makes it more difficult for a petitioner to challenge an SCEA.

(3) Transit Priority Project Streamlined Environmental Impact Report

Instead of an SCEA, a lead agency may choose to perform a streamlined EIR. If, after conducting an Initial Study, the lead agency determines that an EIR is required, it only need address potentially significant impacts. Where a cumulative effect has been adequately addressed and mitigated in a previous EIR (such as the 2008 RTP EIR) that cumulative effect shall not be treated as cumulatively considerable.

The EIR is not required to analyze off-site alternatives to the TPP or discuss a reduced residential density alternative to address the effects of car and light duty truck trips generated by the project. Furthermore, the EIR is not required to include an analysis of growth inducing impacts or any project specific or cumulative impacts from cars and light duty trucks trips generated by the project on global warming or the regional transportation network. The IS must identify any cumulative effects that have been adequately addressed and mitigated in prior applicable certified EIRs and these cumulative effects are not to be treated as cumulatively considerable in the EIR.

(4) Traffic Mitigation Measures

After a public hearing a legislative body or local jurisdiction may adopt traffic mitigation measures that apply to TPPs (such measures must be updated as necessary every five years), including requirements for the installation of traffic control improvements, street or road improvements, and contributions to road improvement or transit funds, transit passes for future residents, or other measures that will avoid or mitigate traffic impacts of TPPs. If such measures are adopted by a local jurisdiction, no additional traffic mitigation are required for TPPs (measures addressing public health and bicycle safety may still be imposed).

OTHER CEQA STREAMLINING

SB 375 also provides for general CEQA streamlining for residential and mixed-use residential projects as well as TPPs. Pursuant to Section 21159.28 of the Public Resources Code, projects that meet the following requirements can be subject to streamlined CEQA review:

- A residential or mixed-use residential project (or a TPP) consistent with the designation, density, building intensity, and applicable policies specified for the project area in an accepted SCS (a residential or mixed-use residential project is a project where at least 75 percent of the total building square footage of the project consists of residential use or a project that is a transit priority project); and

- Incorporates the mitigation measures required by an applicable prior environmental document.

If a project meets these requirements, any exemptions, negative declarations, mitigated negative declarations, SCEA, EIR or addenda prepared for the projects shall not be required to reference describe, or discuss:

(1) growth inducing impacts; and
(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.

SCAG'S 2012-2035 RTP/SCS PEIR

CEQA Incentive

As previously discussed, SB 375 provides incentives in the form of CEQA streamlining to encourage community design that supports reduction in per capita GHG emissions. The land use input for SCAG's SCS was created with the use of Traffic Analysis Zones (TAZ) and Development Types. "Development Types" were made at the TAZ level of geography (with an average size of 160 acres) to offer local jurisdictions adequate information and flexibility to make appropriate consistency findings for projects eligible to receive CEQA streamlining benefits.

The Development Types used in the SCS do not represent detailed, parcel-level land use designations such as those found within a local jurisdiction's General Plan, but rather represent the aggregation of multiple land uses, densities and intensities that are expected to preponderate or average out within a neighborhood-sized area by 2035. Each Development Type is comprised of various characteristics related to employment and housing density, urban design, mix of land uses, and transportation options. Details describing the characteristics contained within each Development Type are available in Appendix: SCS Background Documentation. The lead agency, not SCAG, will be responsible for making the determination of consistency for CEQA streamlining purposes, pursuant to the provisions of SB 375, for any given proposed

project. See Govt. Code § 65080(b)(2). One way of determining consistency is if a proposed residential/mixed use or TPP conforms to the Development Type designated for a TAZ.

The Development Types are expressed in terms of use designations, densities and building intensities; and, for any given type, there is one residential density indicated. For example, the "Town Center" Development Type reflects an estimated average density of 22 residential units per acre. However, it is important to note that the designation is a potential ultimate average for the TAZ -- and is not an absolute project-specific requirement that must be met in order to determine consistency with the SCS. In other words, the SCS was not developed with the intent that each project to be located within any given TAZ must exactly equal the density and relative use designations that are indicated by the SCS Development Type in order for the project to be found consistent with the SCS's use designation, density, building intensity and applicable policies. Instead, any given project, having satisfied all of the statutory requirements of either a residential/mixed-use project or TPP as described above, may be deemed by the lead agency to be consistent with the SCS so long as the project does not prevent achieving the estimated average use designations, densities and building intensities indicated by the Development Type within the TAZ, assuming that the TAZ will be built-out under reasonable local planning and zoning assumptions.

SCAG's growth projection data is available on its website for lead agencies to use to determine whether projects are consistent with the SCS.

ORGANIZATION OF THE PEIR

This document is organized into eight chapters, plus an Executive Summary. The Executive Summary contains a review of the expected environmental impacts resulting from implementation of the proposed 2012-2035 RTP/SCS and the measures recommended to mitigate those impacts. The summary also includes a comparison of the expected environmental effects of each RTP alternative.

Chapter 1.0: Introduction. This chapter is comprised of this introduction and the PEIR analytical approach. It describes the purpose, scope and methodology of the PEIR, the environmental review process, and an overview of the contents of the PEIR.

Chapter 2.0: Project Description. In this chapter the background and location of the Plan is given, including a review of state and federal legislation that guides the process of developing an RTP. A discussion of the purpose and need for the 2012-2035 RTP/SCS is presented with the projected growth in the region. An overview of the major components of the 2012-2035 RTP/SCS is also presented.

Chapter 3.0: Environmental Settings, Impacts and Mitigation Measures. This chapter identifies the setting for the 2012-2035 RTP/SCS and provides a programmatic analysis of the 2012-2035 RTP/SCS for the region. The following resource categories are analyzed in this section: Aesthetics and Views; Air Quality; Biological Resources (including Open Space); Cultural Resources; Geology, Soils and Mineral Resources; Greenhouse Gases; Hazardous Materials; Land Use and Agricultural Resources; Noise; Population, Employment and Housing; Public Services and Utilities (including Energy); Transportation (including Security), and Water Resources. For each of these environmental areas, the analysis addresses Environmental Setting, Regulatory Setting, Methodology, Significance Criteria, Impacts and Mitigation Measures. As required by CEQA the determination of impacts is based on a comparison of the proposed plan to existing conditions. A discussion of the proposed plan compared to the No Project Alternative is also provided for informational purposes.

Chapter 4.0: Comparison of Alternatives. In this chapter the Alternatives are evaluated and compared to the 2012-2035 RTP/SCS for each resource/issue area identified above.

Chapter 5.0: Long Term Effects. This chapter identifies the significant unavoidable environmental changes, significant irreversible impacts, growth inducing impacts and cumulative impacts of the 2012-2035 RTP.

Chapter 6.0: Report Authors, Organizations and Persons Consulted. This chapter lists the contributors to the preparation of this PEIR.

Chapter 7.0: Glossary. This chapter includes the acronyms used in the document.

Chapter 8.0: Map Chapter (separate document). This chapter includes all of the maps referenced throughout the PEIR.

Technical Appendices. The PEIR appendices include: the Notice of Preparation, Responses to Notice of Preparation, 2012-2035 RTP/SCS Project List, Screening-level Health Risk Assessment (HRA), Greenhouse Gas assumptions, Biological Resource Tables (large-scale protected areas in the SCAG region), Cultural Resources table including sites in the SCAG Region Listed on the Natural Register of Historic Places, National Historic Landmarks and California Points of Historic Interest.

2.0 PROJECT DESCRIPTION

This chapter provides a detailed description of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (2012-2035 RTP/SCS or Plan). The project description discussion includes the background of the proposed project, the project objectives, and a description of the existing environment in the SCAG region.

2.1 PROJECT BACKGROUND AND LOCATION

This Program Environmental Impact Report (PEIR) evaluates the potential environmental impacts associated with the adoption of the 2012-2035 RTP/SCS by the Southern California Association of Governments (SCAG). This document has been prepared to meet the requirements of the California Environmental Quality Act (CEQA) Statutes Public Resources Code Section 21000 et seq., CEQA Guidelines Title 14 California Code of Regulations (CCR), § 15000 et seq., and Senate Bill (SB) 375.

SCAG is the federally designated Metropolitan Planning Organization (MPO) under Title 23, United States Code (U.S.C.) 134(d)(1) for the six-county region that includes the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. These counties are shown in **Map 2-1** located in Chapter 8.0 (Maps). As an MPO, SCAG is required to adopt and update a long-range transportation plan every four years.

The SCAG region also contains 14 subregions as shown in **Map 2-2** located in Chapter 8.0 (Maps). The total area of the region is approximately 38,000 square miles and stretches from the state borders of California/Nevada and California/Arizona to the Pacific Ocean and from the southernmost edge of the Central Valley to the Mexican border. The region includes the county with the largest land area in the nation, San Bernardino County, as well as the county with the highest population in the nation, Los Angeles County. The SCAG region is home to 18 million people, or 49 percent of California's population. If it were its own state, the SCAG region would be the fifth most populous in the nation, just behind Florida and ahead of Illinois.

The SCAG region encompasses several federally designated non-attainment and maintenance areas for air quality standards. The U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) under Section 176(c) of the Federal Clean Air Act [42 U.S.C. 7506(c)] require that for a non-attainment area conformity determinations on updated transportation plans and programs must be made every four years. The 2012-2035 RTP/SCS is the quadrennial update to the RTP that was last adopted in May 2008. All RTPs must conform to air quality requirements, as well as meet a number of other requirements, including specific requirements on the "horizon" year of regional transportation plans (the horizon year must be at least 20 years in to the future). In order to comply with those requirements, the 2012-2035 RTP/SCS includes a horizon year of 2035. Transportation investments in the SCAG region that receive State and federal funds or require federal approvals must be consistent with the RTP and must be included in SCAG's Federal Transportation Improvement Program (TIP) when funded. The TIP covers six years and is updated biennially on an even-year cycle. It represents the immediate, near-term commitments of the RTP. In order to continue receiving federal transportation funds the SCAG region must have a conforming RTP/SCS in place by June 2012.

SCAG is also required to prepare a RTP and pursuant to Section 65080 of the California Government Code. The State requirements largely mirror the federal requirements and require each Regional Transportation Planning Agency (RTPA) in urban areas to adopt and submit an updated RTP to the California Transportation Commission (CTC) and the California Department of Transportation (Caltrans) every four years. To ensure a degree of statewide consistency in the development of RTPs, the CTC under Government

Code Section 14522 prepared RTP Guidelines. The adopted guidelines include a requirement for program level performance measures, which include objective criteria that reflect the goals and objectives of the RTP. In addition, the initial years of the plan must be consistent with the Federal Transportation Improvement Program (TIP). Pursuant to SB 375, SCAG is required to submit the Sustainable Communities Strategy to the California Air Resources Board for the purpose of determining whether the greenhouse gas targets have been met.

The 2012-2035 RTP/SCS is a long-range Regional Transportation Plan that includes projects, policies, and strategies to create a blueprint for the region's growth through 2035. The Plan includes improvements to the transportation system. These improvements include closures to critical gaps in the network that hinder access to certain parts to the region, as well as the strategic expansion of the transportation system. In addition to new projects that are included in the Plan, many projects from the 2008 RTP are included in the 2012-2035 RTP/SCS and are now considered committed or at least reasonably foreseeable (i.e., they are in the FTIP and are thus included in the No Project condition).

The 2012-2035 RTP/SCS is intended to meet the changing socioeconomic, transportation infrastructure, financial, technological and environmental conditions of the region. Individual projects are preliminarily identified in the 2012-2035 RTP/SCS; however, this PEIR is programmatic in nature and does not specifically analyze these projects. Project-level analyses will be prepared by implementing agencies on a project-by-project basis as projects proceed through the design and decision-making process. Project-specific planning and implementation undertaken by each project sponsor/implementing agency will depend on a number of issues, including: policies, programs and projects adopted at the local level; restrictions on federal, State and local transportation funds; the results of feasibility studies for particular corridors; and project-specific environmental review.

Under SB 375, the California's Sustainable Communities and Climate Protection Act, SCAG is also required to prepare an SCS as part of the RTP, that reduces greenhouse gas (GHG) emissions by eight percent per capita by 2020 and 13 percent per capita by 2035, as set by the California Air Resources Board (ARB). According to Section 65080 of the California Government Code, in summary the SCS must:

- Identify existing land use;
- Identify areas to accommodate long-term housing needs;
- Identify areas to accommodate an eight-year projection of regional housing needs;
- Identify transportation needs and the planned transportation network;
- Consider resource areas and farmland;
- Consider state housing goals and objectives;
- Set forth a forecasted growth and development pattern; and
- Comply with federal law for developing an RTP.

SCAG's SCS demonstrates the region's ability to attain the GHG emissions reduction targets set forth by the ARB. The SCS outlines SCAG's plan for integrating the transportation network and related strategies with an overall land use pattern that responds to projected growth, housing needs and changing demographics, and transportation demands.

Prior to adopting the 2012-2035 RTP/SCS, SCAG's Regional Council must certify the PEIR for the Plan. Local and State transportation agencies will use the 2012-2035 RTP/SCS and the PEIR as a reference for their own planning purposes.

2.2 PURPOSE AND NEED FOR ACTION

The purpose of the 2012-2035 RTP/SCS is to provide a clear, long-term vision of the regional transportation goals, policies, objectives and strategies for the SCAG region while at the same time providing strategies to reduce greenhouse gas emissions as required by SB 375. The necessity for the RTP/SCS is driven by the need to plan for improvements to the aging regional transportation system and preserve its long-term viability in light of the projected population growth.

The 2012-2035 RTP/SCS reduces greenhouse gas emissions as required by SB 375. The 2012-2035 RTP/SCS identifies infrastructure projects and improvements to reduce traffic and congestion. The 2012-2035 RTP/SCS includes mobility as an important component and also incorporates added emphasis on sustainability and integrated planning. The vision for the 2012-2035 RTP/SCS encompasses three principles: mobility, economy, and sustainability. 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 2012-2035 RTP/SCS is a blueprint for improving the quality of life for residents of the SCAG region 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. The Plan would also generally improve air quality (except for re-entrained roadway dust resulting from total vehicle miles travelled), improve health (as a result of greatly reduced diesel particulates that are strongly correlated with cancer risk) 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 that reduce 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.

Over the lifetime of the 2012-2035 RTP/SCS, SCAG forecasts that there will be an additional 3.88 million people added to this large and diverse area. The 2012-2035 RTP/SCS is based on growth forecasts in the region in 2035 as shown in **Table 2-1**.

TABLE 2-1: 2035 POPULATION, HOUSEHOLDS, AND EMPLOYMENT IN THE SCAG REGION

	2035 Population		2035 Households		2035 Employment	
County	**No Project**	**Plan**	**No Project**	**Plan**	**No Project**	**Plan**
Imperial	288,200	288,200	90,800	90,800	121,100	121,100
Los Angeles	11,350,400	11,350,400	3,851,300	3,851,300	4,826,600	4,826,600
Orange	3,417,800	3,417,800	1,123,500	1,123,500	1,779,000	1,779,000
Riverside	3,380,900	3,380,900	1,091,500	1,091,500	1,236,800	1,236,800
San Bernardino	2,749,800	2,749,800	847,400	847,400	1,059,400	1,059,400
Ventura	958,700	958,700	318,400	318,400	413,200	413,200
SCAG Region	**22,145,800**	**22,145,800**	**7,322,900**	**7,322,900**	**9,436,100**	**9,436,100**

SOURCE: SCAG Population Growth Forecasting, 2011.

Federal guidelines (40 CFR §1502.13) require the preparation of a statement of purpose and need in conjunction with environmental documents prepared to meet the requirements of the National Environmental Policy Act (NEPA). In accordance with these guidelines, these statements are prepared to briefly specify the underlying purpose of the project and the need for the project to which the lead agency is responding in proposing actions and/or alternatives. Although adoption of the 2012-2035 RTP/SCS is not subject to NEPA, SCAG has chosen to include this statement of purpose and need to enable proponents of specific projects

included in the 2012-2035 RTP/SCS to discuss the purpose and need for their individual projects relative to the Plan.

This statement of purpose and need has been prepared to identify the underlying purpose for adopting the 2012-2035 RTP/SCS. It was not prepared to be a comprehensive statement of need for each individual RTP/SCS project. Where appropriate, this statement of need may be incorporated by reference in project-specific NEPA documents as provided in 40 CFR §1502.21.

The transportation planning process for the 2012-2035 RTP/SCS is continuous as the region is constantly undergoing change. The 2012-2035 RTP/SCS presents an assessment of the growth and economic trends in the SCAG region for the years 2008 through 2035 and provides strategic direction for investments during this period.[1]

2.3 PROJECT DESCRIPTION

SCAG is the federally designated MPO under Title 23, U.S.C. 134(g)(1), for the six-county region. SCAG is required by State and federal mandates to prepare an RTP/SCS every four years.

The 2012-2035 RTP/SCS is a long-range regional transportation plan that provides a blueprint to help achieve a coordinated and balanced regional transportation system. Transportation projects in the SCAG region must be included in the RTP/SCS in order to receive federal funding. Transportation projects are listed in Appendix B: Detailed RTP/SCS Project List. The 2012-2035 RTP/SCS is comprised of the following elements: (1) a policy element that presents an overview of the challenges facing the region; the RTP/SCS goals, policies and performance outcomes; (2) the SCS, which includes land use policies and forecasted future growth and land use for the region; (3) an action element that describes the transportation investments and programs necessary to implement the Plan and performance measures to determine how the Plan performs; and (4) the financial element that summarizes the cost of Plan implementation constrained by a realistic projection of available revenues and provides recommendations for the allocation of funds.

The projects, policies and strategies that have committed, available or reasonably available funding sources constitute the 2012-2035 RTP/SCS that is also referred to as the "constrained plan" or Plan.

The 2012-2035 RTP/SCS also contains an additional chapter called the "strategic plan." Unlike the constrained plan, the strategic plan presents a vision for regional improvements beyond committed, available, or reasonably available funding sources. It also identifies additional projects that require study and consensus building before the decision can be made as to whether to commit the funding to include these projects in a future RTP/SCS's constrained plan. These are projects for which funding sources have not been identified, but the implementation of which would provide transportation, air quality and health benefits to the region. These projects include some High-Speed Train (HST) projects as well as additional transit projects, and public transportation investments.

This PEIR does not analyze these strategic projects because their lack of funding indicates that implementation is speculative at this point. In general these projects would improve transportation-related performance in the region and reduce certain types of air emissions. Many of the segments would have environmental impacts along their routes (similar to impacts discussed for RTP/SCS projects) as they may pass through environmentally sensitive areas. If these projects become reasonably foreseeable, their impacts will be addressed in future RTP/SCSs and associated PEIRs.

[1]Note that the RTP/SCS baseline is 2008 as required for RTPs. This PEIR properly uses 2011 as the existing conditions against which impacts are analyzed.

The following describes the major functional components of the 2012-2035 RTP/SCS. Chapters that are not covered in this summary description (i.e. Financial Plan, Public Participation, and Strategic Plan) support the projects, policies and strategies in the sections described here and do not, on their own, contribute to environmental impacts. The chapters of the 2012-2035 RTP/SCS that are relevant to the analysis of potential environmental impacts of the Plan include: Chapter 1: Vision; Chapter 2: Transportation Investments; Chapter 4: Sustainable Communities Strategy; and Chapter 5: Measuring Up, which contains the Environmental Justice component and is associated with a corresponding Environmental Justice Technical Appendix that includes analysis of some of the same issues addressed in the PEIR (noise, air quality) as relevant to low income, minority and other protected groups.

Chapter 1: Vision

The vision for the 2012-2035 RTP/SCS encompasses three principles: mobility, economy, and sustainability. Each of these components is discussed below.

Mobility. A successful transportation network allows the residents of the region to access daily needs, including work, school, shopping, and recreation, without undue burdens of cost, time, or physical danger. An emphasis on mobility will allow residents to choose from a variety of transportation modes that suit their preferences and needs, including active, non-motorized modes such as biking and walking that allow for physical activity and greater health.

Economy. A successful RTP/SCS will create opportunities for business, investment, and employment. The 2012-2035 RTP/SCS proposes $525 billion in investments over the next 25 years.

Sustainability. The 2012-2035 RTP/SCS is subject to specific requirements for environmental performance. Beyond simply meeting these requirements, a successful Plan would allow future residents to enjoy better quality of life, including the ability to lead a healthy lifestyle enjoying clean air and water and ample opportunities for recreation and physical activity. It would have direct benefits by reducing pollutant emissions and expanding opportunities for active transportation.

To guide development of the projects, programs, and strategies, SCAG's Regional Council adopted goals and objectives that help carry out the 2012-2035 RTP/SCS vision. The regional goals reflect the wide-ranging challenges facing transportation planners and decision-makers in achieving the RTP/SCS vision. The goals demonstrate the need to balance many priorities in the most cost-effective manner. SCAG's Regional Council will adopt these goals, shown in **Table 2-2** below, as part of the 2012-2035 RTP/SCS.

TABLE 2-2: 2012-2035 RTP GOALS
Align the plan investments and policies with improving regional economic development and competitiveness
Maximize mobility and accessibility for all people and goods in the region
Ensure travel safety and reliability for all people and goods in the region
Preserve and ensure a sustainable regional transportation system
Maximize the productivity of our transportation system
Protect the environment and health for our residents by improving air quality and encouraging active transportation (non-motorized transportation, such as bicycling and walking)
Actively encourage and create incentives for energy efficiency, where possible
Encourage land use and growth patterns that facilitate transit and non-motorized transportation
Maximize the security of the regional transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies
SOURCE: SCAG, 2012-2035 RTP/SCS, Chapter 1: Vision, Table 1.1, page 13, 2011.

The 2012-2035 RTP/SCS guiding policies help focus future investments on the best-performing projects and strategies that seek to preserve, maintain, and optimize the performance of the existing system. These policies, shown in **Table 2-3,** also emphasize the importance of tracking the Plan's performance through specific indicators.

TABLE 2-3: RTP POLICIES
1. Transportation investments shall be based on SCAG's adopted Regional Performance Indicators.
2. Ensuring safety, adequate maintenance, and efficiency of operations on the existing multi-modal transportation system should be the highest RTP priorities for any incremental funding in the region.
3. RTP land-use and growth strategies in the RTP will respect local input and advance smart growth initiatives.
4. Transportation Demand Management (TDM) and non-motorized transportation will be focus areas, subject to Policy 1.
5. High-Occupancy Vehicle (HOV) gap closures that significantly increase transit and rideshare usage will be supported and encouraged, subject to Policy 1.
6. Monitoring progress on all aspects of the Plan, including the timely implementation of projects, programs, and strategies, will be an important and integral component of the Plan.
SOURCE: SCAG, 2012-2035 RTP/SCS, Chapter 1, Vision, Table 1.2, Page 15, 2011.

As directed by the first RTP policy, performance measures play a critical role in the development of the 2012-2035 RTP/SCS. Performance measures help quantify regional goals, estimate the impacts of proposed investments, and evaluate progress over time. The 2012-2035 RTP/SCS adds two new outcomes: location efficiency and public health. The location efficiency outcome reflects the degree to which land use is improved to provide shorter and easier access to desired destinations, therefore encouraging transit and active transportation modes. The public health outcome monitors pollution emitted from transportation, which causes health problems such as asthma and even premature deaths. The performance measures for the 2012-2035 RTP/SCS builds upon earlier experiences and adds specificity and technical depth to the original measures.

Performance measures are closely tied to the broader goals to ensure that the implementation of the 2012-2035 RTP/SCS moves the region closer to achieving these goals. **Table 2-4** depicts the relationship between the RTP goals and performance measures while **Table 2-5** described the performance measures in greater detail.

Chapter 2: Transportation Investments

The transportation investments included in the 2012-2035 RTP/SCS are comprised of a substantial list of components that are described here, including:

- Safety and Security
- System Monitoring and Evaluation
- System Preservation
- Smart Land Use
- Transportation Demand Management (includes several sub-components)
- Congestion Management Process Systems
- Transportation Systems Management
- Corridor System Management Plans
- System Expansion (includes several sub-components)
- Transit (includes several sub-components)
- Aviation and Ground Access
- Goods Movement Strategies (includes several sub-components)
- Goods Movement Environmental Strategy

TABLE 2-4: RTP GOALS AND RELATED PERFORMANCE MEASURES

RTP Goals	Mobility/ Accessibility	Reliability	Location Efficiency	Productivity	Safety and Health	Economic Well-Being	Cost Effective-ness	System Sustain-ability	Environ-mental Quality
Align the plan investments and policies with improving regional economic development and competitiveness						X			
Maximize mobility and accessibility for all people and goods in the region	X						X		
Ensure travel safety and reliability for all people and goods in the region		X			X				
Preserve and ensure a sustainable regional transportation system								X	X
Maximize the productivity of our transportation system	X			X					
Protect the environment and health for our residents by improving air quality and encouraging active transportation (non-motorized transportation, such as bicycling and walking)					X				X
Actively encourage and create incentives for energy efficiency, where possible			X						
Encourage land use and growth patterns that facilitate transit and non-motorized transportation			X						
Maximize the security of the regional transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies*									

* SCAG does not yet have an agreed-upon security performance measure; therefore it is not included in the table.
SOURCE: SCAG, 2012-2035 RTP/SCS, Chapter 1: Vision, Table 1.3, Page 15, 2011.

TABLE 2-5: RTP OUTCOMES AND PERFORMANCE MEASURES

Outcome	Performance Measures/Indicator(s)	Definition	Performance Target	Data Sources Used
Location Efficiency	Share of growth in High Quality Transit Areas (HQTAs)	Share of the region's growth in households and employment in HQTAs	Improvement over No Project Baseline	Census (including annual American Community Survey), InfoUSA
	Land consumption	Additional land needed for development that has not previously been developed or otherwise impacted, including agricultural land, forest land, desert land and other virgin sites	Improvement over No Project Baseline	Rapid Fire Model
	Average distance for work and non-work trips	The average distance traveled for work or non-work trips separately	Improvement over No Project Baseline	Travel Demand Model
	Percent of work trips less than three miles	The share of total work trips which are fewer than three miles	Improvement over No Project Baseline	Travel Demand Model
	Work trip length distribution	The statistical distribution of work trip length in the region	Improvement over No Project Baseline	Travel Demand Model
Mobility and Accessibility	Person delay per capita	Delay per capita can be used as a supplemental measure to account for population growth impacts on delay	Improvement over No Project Baseline	Travel Demand Model
	Person delay by facility type (mixed flow, HOV, arterials)	Delay – excess travel time resulting from the difference between a reference speed and actual speed	Improvement over No Project Baseline	Travel Demand Model
	Truck delay by facility type (Highway, Arterials)	Delay – excess travel time resulting from the difference between a reference speed and actual speed	Improvement over No Project Baseline	Travel Demand Model
	Travel time distribution for transit, SOV, HOV for work and non-work trips	Travel time distribution for transit, SOV, HOV for work and non-work trips	Improvement over No Project Baseline	Travel Demand Model
Safety and Health	Collision/accident rates by severity by mode	Accident rates per million vehicle miles by mode (all, bicycle/ pedestrian and fatality/killed)	Improvement over Base Year	CHP Accident Data Base, Travel Demand Model Mode Split Outputs
	Criteria pollutant emissions	CO, NO_X, PM2.5, PM10, and VOC.	Meet Transportation Conformity requirements	Travel Demand Model/ARB EMFAC Model
Environmental Quality	Criteria and greenhouse gas emissions	CO, NOX, PM2.5, PM10, and VOC Per capita greenhouse gas emissions (CO2)	Meet Transportation Conformity requirements and SB375 GHG per capita emission reduction targets	Travel Demand Model/ARB EMFAC Model

TABLE 2-5: RTP OUTCOMES AND PERFORMANCE MEASURES

Outcome	Performance Measures/Indicator(s)	Definition	Performance Target	Data Sources Used
Economic Well-Being	Additional jobs supported by improving competitiveness	Number of jobs added to the economy as a result of improved transportation conditions which make the region more competitive.	Improvement over No Project Baseline	Regional Economic Model REMI
	Additional jobs supported by transportation investment	Total number of jobs supported in the economy as a result of transportation expenditures.	Improvement over No Project Baseline	Regional Economic Model REMI
	Net contribution to Gross Regional Product	Gross Regional Product due to transportation investments and increased competitiveness	Improvement over No Project Baseline	Regional Economic Model REMI
Investment Effectiveness	Benefit/Cost Ratio	Ratio of monetized user and societal benefits to the agency transportation costs.	Greater than 1.0	California Benefit Cost Model
System Sustainability	Cost per capita to preserve multi-modal system to current and state of good repair conditions	Annual costs per capita required to preserve the multi-modal system to current conditions.	Improvement over Base Year	Estimated using SHOPP Plan and recent California Transportation Commission 10-Year Needs Assessment

Note: Performance measures tied to goals for reliability, preservation, productivity, health, energy efficiency, and security cannot currently be reliably forecasted and are not included in Table 5.1. However, SCAG has identified related measures to be used for monitoring purposes, and these are discussed in the Performance Measures Technical Report.
SOURCE: SCAG 2012-2035 RTP/SCS, Chapter 5, Measuring Up, Table 5.1, Page 162, 2011.

The approach to developing an investment package for the 2012-2035 RTP/SCS emphasizes system management to maximize the productivity of, and strategically expand the region's existing transportation system. This approach recognizes that an integrated, multi-faceted approach is necessary to address the region's mobility needs.

Safety and Security. Safety improvements are included in the Plan at all levels. Many of the strategy and investment categories in the RTP/SCS aim to improve the safety of the existing transportation network. For instance, enhancing maintenance and preservation of the region's buses, rail track, bridges, and roadway pavements will contribute to reduced accidents and improved safety. Similarly, expanding the network of bike lanes and sidewalks, and bringing them into American with Disabilities Act (ADA) compliance will reduce accidents. Deploying technology such as advanced ramp metering to manage traffic flow also reduces collisions at on-ramps and critical freeway-to-freeway interchanges. SCAG has two main safety and security goals:

- Ensure transportation safety, security, and reliability for all people and goods in the region; and
- Prevent, protect, respond to, and recover from major human-caused or natural events in order to minimize the threat and impact to lives, property, the transportation network and the regional economy.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) required that each state develop a Strategic Highway Safety Plan (SHSP). California adopted a SHSP which had a goal of reducing roadway fatality rate to less than 1.0 fatality per 100 million vehicle miles traveled (VMT) by 2010; California achieved this goal in 2009. California is currently updating their SHSP to further reduce fatality rates. The 2012-2035 RTP/SCS is consistent with that plan as required by federal law.

System Monitoring and Evaluation. System monitoring is the foundation of the transportation system and plays a large part in the 2012-2035 RTP/SCS. As discussed above, SCAG has developed performance measures and tools to track and monitor the progress of the transportation system so that the region can make informed decisions regarding transportation investments. Additionally, transportation professionals and decision-makers have recently committed to improving the region's ability to properly fund the investments needed to comprehensively monitor and evaluate system performance. These investments include detection, closed circuit television systems, bus global positioning systems, and automatic ridership counting systems. Although funding is modest for these activities, they lead to more informed decisions.

System Preservation. Over the decades, the region has invested hundreds of billions of dollars in a multi-modal transportation system. Approximately $217 billion, or almost half of all proposed expenditures through 2035, is allocated to system preservation and maintenance.

Smart Land Use. Since initiating one of the nation's first large-scale regional growth visioning efforts in 2000, SCAG has sought to integrate land use and transportation by working with sub-regions and local communities to increase development densities and improve the jobs/housing balance. Implementing such smart strategies encourages walking, biking, and transit use, and, therefore reduces vehicular demand. That in turn saves travel time, reduces pollution, and leads to improved health. Land use is described fully in Chapter 4 of the 2012-2035 RTP/SCS.

Transportation Demand Management (TDM). In an effort to address travel demand, TDM strategies reduce vehicular demand and thereby congestion, particularly during peak periods. These measures are designed to influence an individual's travel behavior by making alternatives to the single-occupant automobile more attractive. Some examples of TDM strategies are carpools and telecommuting, and "First Mile/Last Mile" strategies to allow travelers to easily connect to and from transit service at their origin and destination. Other strategies include vanpool services for larger employers and rideshare matching services. Los Angeles, Orange, Riverside and San Bernardino Counties jointly sponsor a regional "Guaranteed Ride Home Program," which provides transportation for carpoolers and transit users in emergency situations. In total, the 2012-2035 RTP/SCS dedicates $4 billion to TDM investments.

Increasing Carpooling and Vanpooling. Carpooling is supported by a host of strategies. High Occupancy Vehicle (HOV) lanes and convenient Park-and-Ride Lots increase carpool usage.

Increase the use of transit, bicycling, and walking. The 2012-2035 RTP/SCS also commits $6 billion to active transportation, which will expand bikeways, improve local streets, and address ADA requirements. Additional strategies include traffic calming and Complete Streets strategies, particularly near transit stations and schools, so as to further reduce vehicle trips by improving safety and desirability of active transportation.

Congestion Management Process (CMP). The federal requirement for a CMP was initially enacted in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, and continued in the Transportation Equity Act for the 21st Century (TEA-21) in 1998 and subsequently in SAFETEA-LU. CMP requires monitoring, performance measures, and, in certain cases, mitigation measures. Above all, CMP requires and ensures that highway capacity projects that significantly increase the capacity for single occupancy vehicles (SOV) be developed in a comprehensive context that considers all possible alternatives, including transit, TDM and TSM strategies.

SCAG is proposing two critical improvements to the current CMP process. First, SCAG will incorporate a requirement in the TIP Guidelines that calls for submittal of documentation by the sponsoring agencies associated with significant roadway capacity projects (greater than $50 million) to ensure documentation of all the alternatives considered in defining the project, as well as identifying appropriate mitigation that would be implemented in conjunction with the project.

Second, the 2012-2035 RTP/SCS recognizes the importance of addressing non-recurring congestion (collisions, stalled cars, severe weather). Non-recurring congestion accounts for almost 50 percent of all congestion on the roadway system. So, for the first time, the 2012-2035 RTP/SCS identifies non-recurring congestion delay on the state highway system, both for general purpose lanes and carpool lanes, as a key performance metric that will be monitored and reported over time to ensure SCAG is making progress towards addressing this critical issue.

Transportation Systems Management (TSM). TSM increases the productivity of the existing multi-modal transportation system, thereby reducing the need for costly system expansion. TSM relies in part on intelligent transportation system (ITS) technologies to increase traffic flow and reduce congestion. The 2012-2035 RTP/SCS dedicates up to $6.8 billion to TSM. Examples of TSM categories and their associated benefits are described. TSM will also play an increasingly larger role in regional goods movement improvements.

The Ports of Los Angeles and Long Beach have identified ITS technologies, specifically automated vehicle location (AVL), as a major component in their proposed air quality mitigation strategies. Advanced monitoring will assist in achieving system efficiencies in ports and intermodal operations, reducing delays and wait times at gates and destinations, and allowing for more flexible dispatching, all of which reduce emissions. Weigh-in motion systems and enhanced detection will allow for better enforcement of commercial vehicle rules, reducing pavement damage, and identifying critical paths for goods movement planning in the future. **Table 2-6** shows the TSM categories and their associated benefits.

Corridor System Management Plans (CSMPs). With the passage of Proposition 1B by California voters in November 2006, a program of funding called the Corridor Mobility Improvement Account (CMIA) was created to improve mobility on the state highway system. The CTC adopted guidelines for the CMIA program that required the development of CSMPs for those projects receiving CMIA funding, to ensure that mobility improvements would be maintained over time.

System Expansion. Southern California's highways and arterials extend for almost 22,000 center-line miles and 67,000 lane-miles and serve 53 million travelers each weekday. However, critical gaps remain in the network. Closing these gaps to complete the system will allow greater access and opportunities. **Map 2-3** located in Chapter 8.0 (Maps) shows the Major Highway Projects included in the 2012-2035 RTP/SCS.

TABLE 2-6: TRANSPORTATION SYSTEM MANAGEMENT CATEGORIES AND BENEFITS	
Category	**Benefit**
Enhanced Incident Management	Reduces incident related congestion which is estimated to represent half of the total congestion in urban areas
Advanced Ramp Metering	Alleviates congestion and reduces accidents at on-ramps and freeway to freeway interchanges
Traffic Signal Synchronization	Minimizes wait times at traffic signals and therefore reduces travel time
Advanced Traveler Information	Provides real-time traffic conditions, alternative routing, and transportation choices to the public
Improved Data Collection	Allows agencies to monitor system performance and optimize the impact of transportation investments
Universal Transit Fare Cards (Smart Cards)	Reduces time required to purchase transit tickets and allows inter-operability among transit providers
Transit Automatic Vehicle Location (AVL)	Enables monitoring of transit vehicles and ensuring on-time performance
SOURCE: SCAG, 2012-2035 RTP/SCS, Chapter 2: Transportation Investments, Table 2.1, Page 41, 2011.	

Highway Improvements and Local Arterials. The expansion of highways and local arterials has slowed over the last decade, in part due to increasing costs and environmental concerns. However, critical gaps in the network remain. Locally developed county transportation plans have identified projects that close these gaps and complete the system, and they are included in the Plan. **Map 2-4** located in Chapter 8.0 (Maps) shows the number of existing freeway lanes (2008) and **Map 2-5** located in Chapter 8.0 (Maps) shows the number of freeway lanes in 2035. **Table 2-7** highlights some of these highway completion projects.

TABLE 2-7: MAJOR HIGHWAY COMPLETION PROJECTS		
County	**Project**	**Completion Year /a/**
Imperial	SR-115 Limited Access Expressway	2018
Los Angeles	SR-710 Gap Closure	2030
Los Angeles, San Bernardino	High Desert Corridor	2020
Orange	SR-241 Improvements	2020-2030
Orange, Riverside	CETAP Inter-county Corridor A	2035
Ventura	U.S. 101 and SR-118 Improvements	2018
/a/ Represents the completion year for which the project was analyzed for the RTP modeling and regional emissions analysis. **SOURCE:** SCAG, 2012-2035 RTP/SCS, 2011; Chapter 2: Transportation Investments, Table 2.2, Page 42, 2011.		

Additional categories of highway improvements included in the 2012-2035 RTP/SCS are HOV lanes and connectors, mixed flow (or general purpose) lanes, toll facilities, and Express/High Occupancy Toll (HOT) lanes, and local arterial improvements, as described below. **Table 2-8** summarizes arterial investments in the Plan.

TABLE 2-8: ARTERIAL INVESTMENT SUMMARY	
County	**Investment (in billions)**
Imperial	$1.6
Los Angeles	$6.7
Orange	$4.4
Riverside	$6.1
San Bernardino	$2.6
Ventura	$0.7
Total	**$22.1**
SOURCE: SCAG, 2012-2035 RTP/SCS, 2011; Chapter 2, Transportation Investments, Table 2.4, Page 44, 2011.	

HOV Gap Closures and Connectors. Southern California has invested heavily in HOV lanes, producing one of the nation's most comprehensive HOV networks and highest utilization rates. The 2012-2035 RTP/SCS includes many additional investments to extend the HOV network, strategically close gaps in the HOV network, convert certain limited access HOV lanes to allow for continuous access and construct additional direct freeway-to-freeway HOV connectors to maximize the overall system performance by minimizing weaving conflicts and maintaining travel speeds. **Map 2-6** located in Chapter 8.0 (Maps), shows the 2035 HOV Lane System while **Table 2-9** lists the major HOV projects included in the Plan.

TABLE 2-9 MAJOR HOV PROJECTS

County	Route	From	To	Completion Year /a/
HOV LANE ADDITIONS				
Los Angeles	I-10	I-605	Puente Ave	2014
Los Angeles	I-10	Puente Ave	SR-57/I-210	2018
Los Angeles	I-5	LA/OC County Line	I-605	2018
Los Angeles	I-5	Pico Canyon	Parker Road	2030
Los Angeles	I-405	I-10	U.S. 101	2018
Los Angeles	SR-14	Ave P-8	Ave L	2030
Orange	I-5	Avenida Pico	San Juan Creek Rd	2020
Orange	I-5	SR-55	SR-57	2035
Orange	SR-73	I-405	MacArthur	2035
Riverside	I-215	Nuevo Rd	Box Springs Rd	2030
Riverside	SR-91	Adams St	SR-60/I-215	2018
Riverside	I-15	RIV/SB County Line	I-15/I-215	2020
San Bernardino	I-10	Haven Ave	Ford St	2020
San Bernardino	I-10	Ford St	Riv/SB County Line	2030
San Bernardino	I-215	Spruce St	Orange Show Rd	2014
San Bernardino	I-215	SR-210	I-15	2030
San Bernardino	I-15	RIV/SB County Line	SR-18/Mohave River	2020
FREEWAY TO FREEWAY HOV CONNECTORS				
Los Angeles	I-5/SR-14	Connector		2014
Los Angeles	I-5/I-405	Connector (partial)		2030
Orange	I-405/SR-73	Connector		2035
San Bernardino	I-10/I-15	Connector (partial)		2020
San Bernardino	I-10/I-215	Connector		2030

/a/ Represents the completion year for which the project was analyzed for the RTP modeling and regional emissions analysis.
SOURCE: SCAG Transportation Modeling, 2011

Mixed Flow. Since mixed flow lanes carry more traffic than any other component of SCAG's transportation system, mixed-flow capacity enhancements are also necessary to address traffic bottlenecks and relieve congestion on heavily traveled corridors. This is especially true in areas outside of the urban core where transit service and the HOV network are not fully developed. The 2012-2035 RTP/SCS includes a variety of mixed flow lane additions, mostly outside of Los Angeles County. **Map 2-7**, which is located in Chapter 8.0 (Maps), shows the 2035 Mixed Flow transportation system.

Toll and Express/High Occupancy Toll (HOT) Lane Corridors and Facilities. The 2012-2035 RTP/SCS also includes an expansion of the existing Express/HOT lanes and toll road system in Orange County to address the congested commuter corridor between housing-rich Riverside County and jobs-rich Orange County. Additionally, improvements to several major corridors in other parts of the region are proposed to be financed by tolls, including the SR-710 Tunnel Gap Closure and the High Desert Corridor. **Map 2-8**, in Chapter 8.0 (Maps), shows the 2035 Express/HOT lanes and tolls.

Transit. The 2012-2035 RTP/SCS calls for expansion of transit facilities and service over the next 25 years. **Table 2-10** shows major transit projects included in the 2012-2035 RTP/SCS. The local county sales tax programs, most recently Measure R in Los Angeles County are providing for much of this expansion. In addition, the coordination of development in and around transit stations and corridors, improved service reliability and performance, and a highly focused transit capital investment program appear to yield the best results within the budget limitations that the region faces.

TABLE 2-10: MAJOR TRANSIT PROJECTS

County	Project	Completion Year [/a/]
Los Angeles	Crenshaw/LAX Transit Corridor	2018
Los Angeles	Eastside Transit Corridor – Phase 2	2035
Los Angeles	Exposition Line – Phase 2 to Santa Monica	2018
Los Angeles	Gold Line Extension to Glendora	2018
Los Angeles	Gold Line Extension to Montclair	2035
Los Angeles	Green Line LAX Extension	2035
Los Angeles	Green Line South Bay Extension	2035
Los Angeles	Regional Connector	2020
Los Angeles	San Fernando Valley (East) North/South Rapidways	2018
Los Angeles	San Fernando Valley Orange Line Canoga Extension	2014
Los Angeles	West Santa Ana Branch Corridor	2030
Los Angeles	Westside Subway Extension to Century City	2030
Los Angeles	Westside Subway Extension to Westwood	2035
Orange	Anaheim Rapid Connection	2020
Orange	Bristol/State College, Harbor, and Westminster BRT	2030
Orange	Orange County Metrolink Service Expansion Program	2035
Orange	Santa Ana/Garden Grove Fixed Guideway	2020
Riverside	Metrolink Perris Valley Line Extension to San Jacinto and Temecula	2035
San Bernardino	E Street BRT (sbX)	2014
San Bernardino	Redlands Rail – Phase 1	2018
San Bernardino	Redlands Rail – Phase 2	2020

[/a/] Represents the completion year for which the project was analyzed for the RTP modeling and regional emissions analysis.
SOURCE: SCAG, 2012-2035 RTP/SCS, 2011; Chapter 2, Transportation investments, Table 2.5, Page 49, 2011.

In addition to the specific transit plans, projects and programs proposed, the 2012-2035 RTP/SCS also supports the following policies and actions:

- Encourage the development of new transit modes in our sub-regions, such as BRT, rail, limited-stop service, and point to point express services utilizing the HOV and Express/HOT lane networks;
- Encourage transit providers to increase frequency and span of service in transit-oriented development (TOD) and high quality transit areas (HQTAs) and along targeted corridors where there is latent demand for transit services;
- Collaborate with local jurisdictions to provide a network of local community circulators that serve new TOD and HQTAs, providing an incentive for residents and employees to make trips on transit;
- Develop first mile/last mile strategies on a local level to facilitate access to the transit system via local circulators, active transport, scrip, or vehicle sharing. Continue partnering with member cities and sub-regions to do localized first mile/last mile planning;
- Encourage transit fare discounts and local vendor product and service discounts for residents and employees of TOD and HQTAs, or for a jurisdiction's local residents in general who have fare media. Advocate for increased operational funding for transit service from the state sources;

- Encourage transit properties to pursue cost containment strategies;
- Work with the cities to identify and mitigate choke points in the regional transportation system that affect transit; and
- Work with CTCs, municipalities, and transit operators to develop bus facilities.

The 2012-2035 RTP/SCS also includes significant investments in commuter rail, intercity passenger rail, and the eventual implementation of the California High-Speed Train (HST) Program. This plan lays out an investment strategy of incremental speed and capacity improvements to existing Amtrak and Metrolink service to provide interim high speed service within the SCAG region, while building towards an eventual connection to the statewide high speed network. Specifically, a series of grade separations, grade closures, track expansions, station improvements, earthen works, and other early investments will allow more and faster service in the Los Angeles to San Diego (LOSSAN) and Antelope Valley Corridors. A phased California High-Speed Train implementation strategy, in accordance with the California High Speed Rail Program Draft 2012 Business Plan, will provide initial high-speed train service to the San Fernando Valley, with an extension by 2035 south to Los Angeles Union Station and the Anaheim Regional Transportation Intermodal Center. **Map 2-9**, located in Chapter 8.0 (Maps) shows the 2035 rail transit system. As these efforts are still in the initial stages of planning and analysis, alignment and schedule details are subject to change.

Passenger and High-Speed Rail. The 2012-2035 RTP/SCS proposes three Passenger Rail strategies (improvements to the LOSSAN Corridor, improvements to the existing Metrolink system, and the implementation of Phase I of the California High-Speed Train [CA HST] project) that will provide additional travel options for long-distance travel within the region and to neighboring regions. The recent release of the Draft CA HST Business Plan now estimates a statewide Phase I cost of $98.5 billion (in year of expenditure dollars) with service extended to the SCAG region in 2033. Within the Draft CA HST Business Plan, there are a variety of strategies to connect Northern and Southern California to the state network and includes incremental improvements that can be made in advance of and in preparation for that connection. Therefore, stakeholders throughout Southern California are seeking to implement a phased and blended implementation strategy for high-speed rail by employing state and federal high-speed rail funds to improve existing services, eventually meeting the Federal Rail Administration's (FRA) 110 miles per hour (MPH) definition of high-speed service. These speed and service improvements to the existing LOSSAN and Metrolink corridors will deliver the California High-Speed Rail Authority's (Authority) new blended approach, and at the same time permanently improve the SCAG region's commuter and intercity rail services. In addition to the specific plans, projects, and programs proposed, the 2012-2035 RTP/SCS supports the following policies and actions related to the passenger and high-speed rail program:

- Implement cooperative fare agreements and media between Amtrak and LOSSAN, and CA HST when it begins revenue service;
- Implement cooperative marketing efforts between Amtrak and LOSSAN, and CA HST when it begins revenue service;
- Encourage regional and local transit providers to develop rail interface services at Metrolink, Amtrak and high-speed rail stations; and
- Work with the Authority and local jurisdictions to plan and develop optimal levels of retail, residential and employment development that fully takes advantage of new travel markets and rail travelers.

The California High-Speed Train (HST) Project. In 2005, the Authority issued a PEIR selecting a Phase I alignment from Anaheim to Los Angeles, on to the Antelope Valley via the San Fernando Valley, along SR-99 through the San Joaquin Valley, and into the Bay Area via San Jose and along the San Francisco Peninsula. Phase II would add connections to the Inland Empire, San Diego, Sacramento, and possibly the East Bay. In November of 2008, California voters approved Proposition 1A, allocating $9 billion in bond

funds for the project. In 2009 and 2010, the FRA awarded the Authority $3.6 billion in High-Speed and Intercity Passenger Rail discretionary grants, which will be used in the San Joaquin Valley as per FRA direction. Proposition 1A also included $950 million for upgrading and improving connectivity for current rail services that will connect with the HST project, so the need to make speed and service improvements for current rail services in the SCAG region, coupled with the Authority's new blended implementation approach, calls for the need to spend these funds in the next few years.

The primary benefits of Phase I will be realized on a statewide level; however, the SCAG region's interregional travel facilities will also benefit. If successful, the HST system will attract many interregional trips now made by car or airplane, providing an alternative to congested interregional highways and relieving ground congestion near local airports. The Los Angeles to the Bay Area travel market is currently the nation's seventh busiest aviation corridor, and the region's second busiest. Phase I has the potential to free up gate space at regional airports for more international and long haul routes, and relieve some airfield congestion. Similarly, when both Phases I and II are complete, the system will offer connectivity to several airports, helping to meet SCAG's long-term goal of regionalizing air travel in Southern California. Phase I will also provide regional connectivity in general. All these connections will complement and feed each other, thereby boosting rail and transit ridership across the SCAG region.

Improvements to the Los Angeles to San Diego (LOSSAN) Rail Corridor. The LOSSAN Joint Power Authority partners have begun work on a Strategic Implementation Plan, which will guide service and business planning and provide a corridor wide implementation plan for capital improvement projects. Strategies in the LOSSAN program will include grade closures, the installation of quad gates and raised medians, grade separations, the installation of sidings and double tracks, electronic and positive train control technologies, track straightening, and other speed capacity improvements. Ultimately, the goal is that express services along the corridor will travel between San Diego and Los Angeles in under two hours.

Improvements to the Existing Metrolink System. The Southern California Regional Rail Authority is currently the sole operator of the Metrolink system, which serves primarily as a commuter rail service in the SCAG region. Metrolink operates 512 track miles of service along seven routes in Ventura, Orange, Los Angeles, San Bernardino, Riverside and San Diego Counties. Metrolink passengers travel much further than most transit passengers, having an average trip length of 36.9 miles. Four routes, the Ventura County Line, the Orange County Line, the Inland Empire/Orange County Line, and the SR-91 Line, share portions of the LOSSAN Corridor with the Pacific Surfliner. By 2035, the HST project will provide a high-speed travel option to the Bay Area and the Central Valley via the existing valley subdivision, which is currently used by the Metrolink Antelope Valley Line. An aggressive program of track straightening, grade separations, and track and siding expansion is expected to reduce express travel times to roughly one hour. When Phase I of the State HST project is completed, Metrolink and Amtrak routes will serve as feeders, providing access to a new long distance travel mode. Travelers expected to access the State project at stations in the cities of Los Angeles, Burbank, San Fernando, Palmdale, Norwalk and Anaheim. The Authority's 2009 Business Plan posits that passengers will travel between Los Angeles and San Francisco in less than three hours, for about 80 percent of comparable airfare.

Bus Transit. **Map 2-10** located in Chapter 8.0 (Maps) shows the bus network in 2035. The 2012-2035 RTP/SCS allocates additional funding to bus transit in the region. Fixed route bus lines in the region are continuously evaluated and adjusted. Los Angeles County also offers Bus Rapid Transit (BRT) on many of its core corridors. In addition, new services are planned across the region, including:

- Orange County's first BRT services and new trolley systems in Santa Ana, Anaheim, and Garden Grove
- Riverside and San Bernardino Counties' first BRT services
- Development of an extensive express bus point-to-point network based on the expanding HOV and Express/HOT lane networks

- Increasing the frequency and quality of fixed-route bus service and the introduction of local community circulators to provide residents of smart growth developments with the option of taking transit over using a car to make short, local trips
- The implementation of transit priority facilities, such as bus lanes and traffic signal priority

Active Transportation. Active transportation (e.g., bicycling and walking) are essential and increasingly important modes of transportation. These non-motorized modes are low-cost, do not emit greenhouse gases, help reduce roadway congestion, and increase health and the quality of life. As the region works towards reducing congestion and air pollution, walking and bicycling will become more essential to meet the future needs of the residents. National Household Travel Survey (NHTS) data indicate that approximately 21 percent of all trips in the region in 2009 were conducted by walking (19 percent) or bicycling (2 percent), representing an approximately 75 percent increase from the 12 percent active transportation mode share in 2000. The 2009 NHTS data also showed that there was an 11 percent decrease in driving from 84 percent to 75 percent. More active transportation has placed a greater focus on the preservation, maintenance and expansion of active transportation infrastructure. As the population in the SCAG region grows and matures, and as parts of the region move towards denser, mixed-use, and transit-oriented development, the demand and use of active transportation will increase. **Map 2-11** located in Chapter 8.0 (Maps) shows the regional bicycle network.

Coastal Trails. In addition to bikeways, local trails have played an important role to increase accessibility and provide opportunities for active transportation. Trails along the coast of California have been utilized as long as people have inhabited the region. In an effort to develop a "continuous public right-of-way along the California coastline; a trail designed to foster appreciation and stewardship of the scenic and natural resources of the coastal trekking through hiking and other complementary modes of non-motorized transportation," the California Coastal Trail (CCT) was established. SCAG proposes the completion of the CCT to increase active transportation access to the coast. Completion of the CCT would provide 183 miles of multi-purpose trails.

Safe Routes to School (SRTS). SAFETEA-LU established the SRTS program to "enable and encourage primary and secondary school children to walk and bicycle to school" and to support infrastructure-related and behavioral projects that are "geared toward providing a safe, appealing environment for walking and bicycling that will improve the quality of children's lives and support national health objectives by reducing traffic, fuel consumption, and air pollution in the vicinity of schools." SRTS programs play a critical role in eliminating some of the vehicle trips that occur during peak periods to drop-off or pick up students by ensuring safe routes to bike or walk to school.

Complete Streets. The Complete Streets Act of 2008 (AB 1358) requires cities and counties to incorporate the concept of Complete Streets in their general plan updates to ensure that transportation plans meet the needs of all users of the roadway system. SCAG supports and encourages implementation of Complete Street policies in the 2012-2035 RTP/SCS. SCAG will work with the local jurisdictions as they implement Complete Streets strategies within their jurisdictions by providing information and resources to support local planning activities.

Aviation. Air travel in the SCAG region continues to grow. The 2012-2035 RTP/SCS's regional air passenger demand forecast is 145.9 million annual air passengers (MAP) in 2035. See **Figures 2-1** and **2-2** (from the 2012-2035 RTP/SCS, page 60) for forecast passenger and cargo demands by airport in 2035. This forecast is based on, but lower than, forecasts adopted in previous RTPs, such as the 165.3 MAP forecast adopted in the 2008 RTP. At 5.61 million tons of cargo in 2035, the Plan's air cargo demand forecast is also much more conservative than what was adopted in the 2008 RTP for 2035 (8.28 million tons).

Figure 2-1: Passenger Airport Allocations

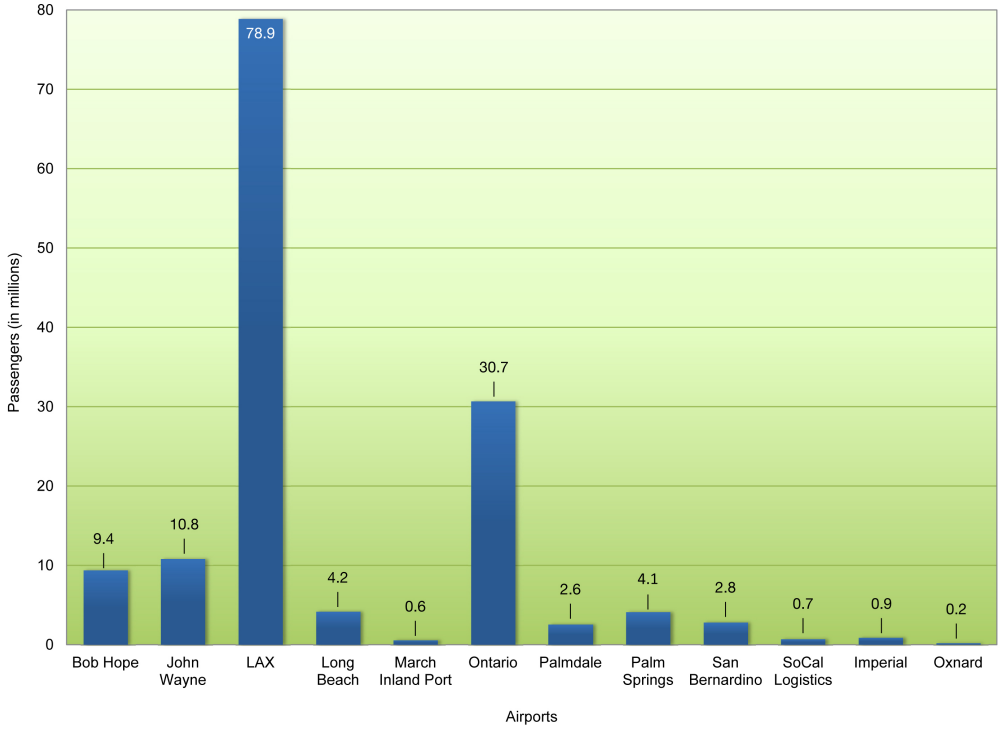
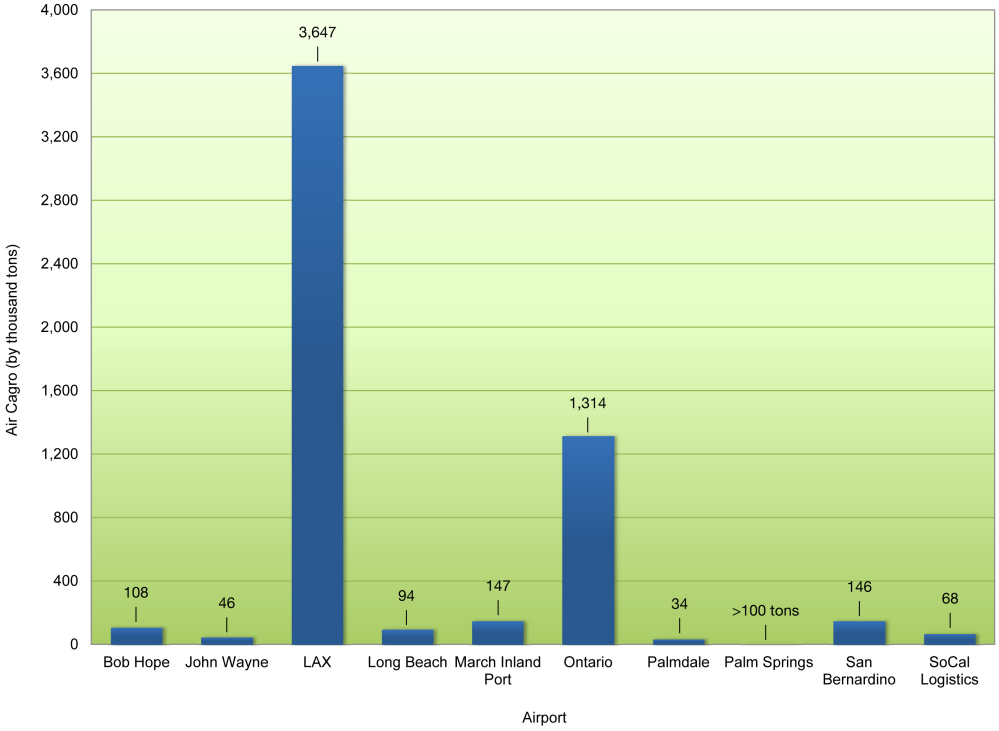


Figure 2-2: Air Cargo Demand Airport Allocations



Like previous forecasts, this long-range forecast is based on interim forecasts that show the urban capacity-constrained airports of Los Angeles International Airport (LAX), Bob Hope, Long Beach and John Wayne airports all reaching their defined legally permissible capacity or physical capacity constraints well before 2035. The remaining air travel demand is served by the other, suburban airports with ample capacity to serve future demand, including Ontario International, San Bernardino International, March Inland Port, Palmdale, Southern California Logistics, and Palm Springs airports. A small amount of future air passenger demand would also be served by the two commuter airports in the region, Oxnard and Imperial airports.

Recent trends question the ability to shift air traffic from the urban airports to the outlying/suburban airports that have the capacity to accommodate the forecast growth. In order to attract the number of passengers to the suburban airports envisaged in the 2035 regional air passenger demand forecast, some incentives are likely to be needed to encourage airlines to offer service at these airports. Potential incentives fall into three broad categories:

- Improvements to the airport ground access system that would make the alternate airports more accessible to travelers from those parts of the region that currently find the core urban airports more convenient;
- Measures that would reduce the cost to the airlines of offering service at the alternate airports, either through direct subsidy or by reducing airport fees and charges relative to the more congested airports; and
- Marketing programs to encourage air travelers to consider using the air services at the alternate airports.

General Aviation. SCAG also updated regional general aviation demand forecasts for the 44 general aviation airports in the region, as well as for the 10 commercial airports in the region that support general aviation activity. The forecast developed by SCAG shows a decline in regional general aviation operations by about 32 percent from 2010 to 2035. The main reason for the anticipated decline is the fact that the aging pilot population is not expected to be adequately replenished by new student pilot starts.

Airport Ground Access Strategy. The RTP identifies strategies to improve airport ground access (and egress). SCAG coordinates closely with airport authorities and county transportation commissions to identify and prioritize specific projects." To be effective in attracting passengers to air service at the alternate airports, ground access improvements will need to significantly reduce the travel time and/or cost of accessing the suburban airports. This is likely to be a particular concern with airports such as Palmdale, which is almost 70 miles from Downtown Los Angeles and approximately 50 miles from communities in the San Fernando Valley.

Improved transit and rail services that are planned to connect to airports include the extension of the Metro Gold Line to Ontario and improvements to Metrolink service on the Antelope Valley and San Bernardino lines. While the volume of airport passengers alone would not justify the cost of these projects, if they are being done anyway to address other travel needs, SCAG can work with the relevant agencies to make sure that the connections to the alternate airports are well planned and marketed. In the case of Ontario Airport, airport passenger volumes may be high enough to support express bus service from remote terminals at such locations as the Anaheim Regional Transportation Intermodal Center, Los Angeles Union Station, and the Van Nuys FlyAway terminal in the San Fernando Valley. These facilities all currently exist or will exist by 2035, so it would be necessary to operate the bus service. It is unlikely that the volumes of air passengers at the other three alternate airports would be high enough to support dedicated express bus service, but it might be possible to serve San Bernardino International Airport as an extension of express bus service to Ontario Airport from Union Station or Van Nuys.

Goods Movement Strategies. Goods movement and freight transportation are essential to support the SCAG regional economy and quality of life. In 2010, over 1.15 billion tons of cargo valued at almost $2 trillion moved across the region's system.[2] Whether carrying imported goods from the San Pedro Bay Ports to

[2]FHWA Freight Analysis Framework: http://faf.ornl.gov/fafweb/Extraction0.aspx, accessed November 2011.

regional distribution centers, supplying materials for local manufacturers, or delivering consumer goods to SCAG residents, the movement of freight provides the goods and services needed to sustain regional industries and consumer needs on a daily basis. The region's goods movement system is comprised of seaports, land ports, air cargo facilities, interstate highways and local roads, Class I railroads and warehouse and distribution centers and is shown in **Map 2-12** located in Chapter 8.0 (Maps)**.**

Following the completion of the 2008 RTP, SCAG initiated the Comprehensive Regional Goods Movement Plan and Implementation Strategy. This effort, involving diverse regional stakeholders, is intended to identify a multimodal regional freight plan that integrates existing strategies and projects with newly developed regional initiatives advanced through the study. Some of these strategies are highlighted below.

Regional Clean Freight Corridor System. In past RTPs, SCAG has envisioned a system of truck-only lanes extending from the San Pedro Bay Ports to Downtown Los Angeles along the I-710, connecting to an east-west segment, and finally reaching the I-15 in San Bernardino County. As part of the 2012-2035 RTP/SCS, SCAG includes a refined concept for the east-west corridor component of the system and connections to an initial segment of I-15. After adoption of the 2012-2035 RTP/SCS, it is anticipated that significant additional study of alignments will be conducted, including an alternatives analysis completed as part of a full environmental review.

The East-West Freight Corridor would carry between 58,000 and 70,000 trucks per day—trucks that would be removed from adjacent general-purpose lanes and local arterial roads. The corridor would benefit a broad range of goods movement markets: between 25–40 percent of the trucks would be port-related, almost 40 percent would serve local goods movement dependent industries, and the remainder would support domestic trade. Truck delay would be reduced by up to 11 percent while speeds for autos on SR-60 would be improved by 11 to 12 percent. Truck traffic on the SR-60 general purpose lanes would be reduced by 42 to 82 percent, depending on location, by as much as 33 percent on I-10, and by as much as 20 percent on adjacent arterials. Separating trucks and autos would also reduce truck-involved accidents on east-west freeways that currently have some of the highest accident levels in the region (20 to 30 accidents a year on certain segments).

For the 2012-2035 RTP/SCS, the regional freight corridor system also includes an initial segment of I-15 that would connect to the East-West Freight Corridor, reaching just north of I-10. Additional study will be undertaken to complete specification of the I-15 component of this project.

Bottleneck Strategies. SCAG recently studied key regional truck bottlenecks and associated projects. Through this analysis, project concepts that may address the highest priority truck bottlenecks and have the most significant impact on delay were identified and continue to be evaluated. The 2012-2035 RTP/SCS allocates an estimated $5 billion to address goods movement bottleneck relief strategies. Examples of bottleneck relief strategies include ramp-metering, extension of merging lanes, ramp and interchange improvements, capacity improvements, and auxiliary lane additions. Annually, 3.6 million hours of heavy truck delay during the most congested time periods on area roadways could be eliminated if the highest priority truck bottlenecks in the region are addressed.

Rail Strategies. As part of the Comprehensive Regional Goods Movement Plan and Implementation Strategy, SCAG worked closely with regional stakeholders to develop a set of rail strategies aimed at increasing freight and passenger mobility, promoting job creation and retention, improving safety, and mitigating environmental impacts. **Map 2-13** located in Chapter 8.0 (Maps) shows grade separations within the SCAG region.

Mainline rail improvements and capacity expansion includes rail-to-rail grade separations, double or triple-tracking certain rail segments, implementing new signal systems, building universal crossovers, and constructing new sidings.

These improvements would benefit both freight rail and passenger rail service depending on their location:

- **Rail yard improvements**: This includes upgrades to existing rail yards as well as construction of new yards. These projects would provide vital improvements to the region's ability to handle the projected growth in cargo volumes.
- **Rail operation safety improvements**: This includes technology such as Positive Train Control (PTC) that can greatly reduce the risk of rail collisions.
- **Grade separations of streets from rail lines**: These projects reduce vehicular delay, improve emergency vehicle access, reduce the risk of accidents, and lower emissions levels.

Key rail projects in the 2012-2035 RTP/SCS include:

- Rail-to-rail grade separation at Colton Crossing;
- Additional mainline tracks for the BNSF San Bernardino and Cajon Subdivisions and the UPRR Alhambra and Mojave Subdivisions;
- Southern California International Gateway (SCIG);
- Modernization of the Intermodal Container Transfer Facility (ICTF);
- Highway-rail grade separations; and
- Port-area rail improvements, including on-dock rail enhancements.

The benefits of the rail strategies to the region are considerable, and include mobility, safety, and environmental gains. As shown in **Table 2-11**, these strategies could eliminate almost 6,000 hours of vehicle delay per day at grade crossings, decrease emissions (NO_X, CO_2, and PM2.5) by almost 23,000 pounds per day, and reduce overall train delay to 2005 levels.

TABLE 2-11: BENEFITS OF THE SCAG REGIONAL RAIL STRATEGY

Mobility	Reduces train delay to 2005 levels
	Provides mainline capacity to handle projected demand in 2035 (includes 43.2 million TEU port throughput)
	Eliminates 5,782 vehicle hours of delay per day at grade crossings in 2035
Safety	Eliminates 69 at-grade railroad crossings
Environment	Reduces 22,789 lbs of emissions per day (CO_2, NO_X and PM2.5 combined) from idling vehicles at grade crossings
	Facilitates on-dock rail
	Reduces truck trips to downtown rail yards and associated emissions

SOURCE: SCAG, 2012-2035 RTP/SCS, 2011; Chapter 2, Transportation investments, Table 2-10, Page 73, 2011.

Goods Movement Environmental Strategy. In Southern California, goods movement and air quality are inextricably linked. Much of the SCAG region (and nearly all of the urbanized area) does not meet federal ozone and fine particulate (PM2.5) air quality standards. Goods movement is a major source of emissions that contributes to these regional air pollution problems as well as localized air pollution "hot spots" that can have adverse health impacts. Goods movement is also a major source of GHG emissions that contribute to global climate change. Although reduction in GHG emissions from goods movement sources is not required under SB 375 (which focuses solely on light-duty vehicle emissions), the state has established GHG reduction goals under California Assembly Bill 32 (AB 32). Clean goods movement activities can contribute to these goals. The region's goods movement strategy is complementary to sustainable communities planning.

The two air pollutants of greatest concern in Southern California are nitrogen oxides (NOx) and fine particulate matter (PM2.5). The South Coast Air Basin is classified as an extreme nonattainment area per the federal ambient ozone standard, with a required attainment date of 2023. Many of the remaining portions of the SCAG region are also in nonattainment for the federal ozone standards.

The 2012-2035 RTP/SCS focuses on a two-pronged approach for achieving an efficient freight system that reduces environmental impacts. For the near-term, the regional strategy supports the deployment of commercially available, low-emission trucks and locomotives while centering on continued investments into improved system efficiencies. For example, upgrading switcher locomotive engines could reduce 1 to 3 percent of regional rail emissions. Additionally, heavy-duty hybrid trucks are already in use, but market penetration can be increased. In the longer term, the strategy focuses on a more fundamental shift in technology—taking critical steps toward gradual implementation of a zero-emission or near zero-emission freight system. Two of many promising technologies that merit further investigation are battery electric trucks and electrified rail systems. This latter component of the regional strategy offers the promise of longer-term environmental sustainability, including significant reductions in GHG emissions. Additionally, SCAG's planning efforts are cognizant of the need to incorporate evolving technologies into new infrastructure.

Both near-term and long-term approaches require substantial investment and lead-time. A path forward to development and deployment of a zero or near-zero emission freight system is summarized below:

- Phase I (2012): Project Scoping—current research and technology testing of some vehicle prototypes constitutes Phase 1.
- Phase II (2014): Evaluation, Development, and Prototype Demonstrations—convene working groups and increase understanding of logistics. Evaluate, develop and test prototype trucks and rail locomotives, as well as wayside power options. Work with public and private sector partners to secure funding commitments for the development of new technology prototypes and demonstrations.
- Phase III (2016): Initial Deployment and Operational Demonstration—Truck fleet evaluation testing and advanced technology locomotive demonstrations.
- Phase IV (2035): Full Scale Demonstrations and Commercial Deployment—includes implementation of regulatory and market mechanisms needed to launch commercialization.

It is important that the region work collaboratively to pursue advanced technologies and secure funding for their development and deployment. Although several regional forums currently exist, SCAG anticipates building on these efforts by establishing a logistics working group with key stakeholders. Participants may include government agencies, logistics industry representatives, and original equipment manufacturers (OEMs).

Modeling of environmental strategies has determined that significant emissions benefits could be achieved from implementation of different zero and near-zero emission environmental strategies. As summarized in **Table 2-12**, the zero-emission East-West Freight Corridor would eliminate 4.7 tons of NO_X, 0.16 tons of PM2.5, and 4,000 tons of CO_2 emissions daily. Full electrification of the rail system, though still a concept at this point, would remove comparable amounts of NO_X, PM2.5, and CO_2. Regionally, a 20 percent market penetration of low-emission trucks (which could fall into the Phase III timeline) would achieve a reduction of 8.3 tons of NO_X, 0.16 tons of PM2.5, and 3,200 tons of CO_2 daily.

TABLE 2.-12: ENVIRONMENTAL BENEFITS

Strategy Impact	NO_X	PM2.5	CO_2
East-West Freight Corridor with 100% Zero-Emission Vehicles (ZEVs)	4.7	0.16	4,000
Full Railroad Main Line Electrification*	10.4	0.19	2,400
20% Penetration of Plug-in Hybrid Trucks	8.3	0.16	3,200

* Further evaluation is required to determine feasible options for implementation of rail electrification or other zero-emission rail systems.
SOURCE: SCAG, 2012-2035 RTP/SCS, 2011; Chapter 2, Transportation investments, Table 2-11, Page 75., 2011

Transportation Investment Summary

Combined, the elements described fully above are the 2012-2035 transportation network. This combination of projects and strategies through the year 2035 are what is evaluated in the PEIR. **Table 2-13** summarizes the project types and costs associated with implementing the 2012-2035 RTP/SCS. In addition, **Tables 2-14**, **2-15** and **2-16** show the existing (note the year 2012 was used for existing conditions throughout this PEIR as modeled data was readily available and it is anticipated to be very close to 2011), No Project and 2012-2035 RTP/SCS lane miles by county.

TABLE 2-13: SUMMARY OF 2012-2035 RTP/SCS PROJECT TYPES (EXCLUSIVE OF MAINTENANCE AND MONITORING PROJECTS)

Project Type	Total Cost (in nominal dollars, billions)
Total Capital Projects	**262.8**
Arterials	22.1
Grade Separation & Goods Movement	47.9
High Occupancy Vehicle/High Occupancy Toll Lanes	18.7
Mixed Flow & Interchange Improvements	18.4
Toll Facilities	35.2
Transportation System Management (including ITS)	6.8
Transit (includes High Speed Rail)	101.3
Active Transportation	6.00
Transportation Demand Management	4.0
Other (includes environmental mitigation, landscaping, and project development costs)	2.5

SOURCE: SCAG Transportation Modeling, 2011.

TABLE 2-14: EXISTING (2012) LANE MILES BY COUNTY

County	Freeway Lane Miles	Toll Lane Miles	Major Arterial Lane Miles	Minor Arterial Lane Miles	Collector Lane Miles	HOV Lane Miles	Total Lane Miles in Each County
Imperial	379	0	433	697	2,445	0	3,954
Los Angeles	4,583	45	8,848	9,076	3,761	479	26,791
Orange	1,294	331	3,242	3,147	601	241	8,857
Riverside	1,722	0	1,181	3,235	3,868	83	10,090
San Bernardino	2,512	0	1,934	4,365	6,080	105	14,996
Ventura	532	0	908	986	682	0	3,108
Total Lane Miles by Project Type	**11,023**	**376**	**16,547**	**21,506**	**17,437**	**908**	**67,796**

SOURCE: SCAG Transportation Modeling 2011.

TABLE 2-15: 2035 NO PROJECT LANE MILES BY COUNTY

County	Freeway Lane Miles	Toll Lane Miles	Major Arterial Lane Miles	Minor Arterial Lane Miles	Collector Lane Miles	HOV Lane Miles	Total Lane Miles in Each County
Imperial	379	0	459	663	2,464	0	3,965
Los Angeles	4,609	0	8,851	9,116	3,844	581	27,002
Orange	1,326	549	3,197	3,167	606	255	9,100
Riverside	1,727	0	1,199	3,126	3,842	102	9,996
San Bernardino	2,503	0	1,886	4,389	6,018	115	14,911
Ventura	510	0	891	971	686	8	3,066
Total Lane Miles by Project Type	**11,055**	**549**	**16,484**	**21,432**	**17,460**	**1,060**	**68,040**

SOURCE: SCAG Transportation Modeling 2011.

TABLE 2-16: 2035 PROJECT LANE MILES BY COUNTY

County	Freeway Lane Miles	Toll Lane Miles	Major Arterial Lane Miles	Minor Arterial Lane Miles	Collector Lane Miles	HOV Lane Miles	Truck Lane	Total Lane Miles in Each County
Imperial	417	0	455	729	2,435	0	0	4,036
Los Angeles	4,681	476	9,234	9,155	3,780	413	193	27,931
Orange	1,426	704	3,261	3,184	604	188	0	9,367
Riverside	1,988	228	1,606	3,976	4,569	125	11	12,503
San Bernardino	2,742	192	2,379	5,030	6,535	168	226	17,271
Ventura	558	0	930	1,010	683	8	0	3,188
Total Lane Miles by Project Type	**11,811**	**1,599**	**17,866**	**23,084**	**18,606**	**902**	**430**	**74,297**

SOURCE: SCAG Transportation Modeling 2011.

The 2012-2035 RTP/SCS includes a conservation planning policy that indicates SCAG could demonstrate progress and satisfy SAFETEA-LU requirements by developing and implementing strategies to support natural land restoration, conservation, protection and acquisition which would also offer greenhouse gas (GHG) emissions reduction benefits. Strategies include engaging in a strategic planning process to determine critical components; identifying and mapping regional priority conservation areas; engaging with partners to determine priority conservation areas and developing an implementation plan; and developing regional mitigation policies or standards.

Chapter 4: Sustainable Communities Strategies (SCS)

The passage of Senate Bill 375 (SB 375) gave SCAG a new area of responsibility and provides the region with a renewed opportunity to focus on an integrated planning effort for the future. SB 375 was established to implement the state's GHG emissions reduction goals, as set forth by AB 32, in the sector of cars and light trucks. This mandate requires the California Air Resources Board to determine per-capita GHG emission reduction targets for each Metropolitan Planning Organization (MPO) in the state at two points in the future—2020 and 2035. Because GHG emissions in the transportation section relate closely with VMT, a mandated GHG reduction essentially requires SCAG to devise a regional plan and a series of strategies that will produce per capita reduction in VMT over the next 25 years, though strategies that do not reduce VMT are also included (such as efforts to encourage non-polluting vehicles). Under SB 375, SCAG and California's 17 other MPOs must address GHG reduction in a SCS as part of the RTP.

Transportation strategies contained in the RTP – managing transportation demand and making transportation system improvements, are major components of the SCS. However, the SCS also focuses on the general land use growth pattern for the region because geographical relationships between land uses (such as density and intensity) help determine the need for travel. The SCS includes both a transportation component (described above) and a land use component (described below). In summary, under SB 375, an SCS must:

- Identify existing and future land use patterns;
- Consider statutory housing goals and objectives;
- Identify areas to accommodate long-term housing need;
- Identify areas to accommodate eight-year housing need;
- Consider resource areas and farmland;
- Identify transportation needs and the planned transportation network;
- Set forth a future land use pattern to meet GHG emissions reduction targets; and
- Comply with federal law for developing an RTP.

However, SB 375 specifically states that the SCS cannot dictate local General Plan policies, but rather is intended to provide a regional policy foundation that local governments may build upon if they so choose and generally includes the quantitative growth projections from each city and county in the region going forward. In addition, qualifying projects that meet statutory criteria and are consistent with the SCS are eligible for streamlined environmental review.

The SCS demonstrates the region's ability to attain and exceed the GHG emission reduction targets set forth by the ARB. The SCS outlines a plan for integrating the transportation network and related strategies with an overall land use pattern that responds to projected growth, housing needs and changing demographics, and transportation demands.

The regional vision of the SCS maximizes current local efforts that support the goals of SB 375, as evidenced by several Compass Blueprint Demonstration Projects and various county transportation improvements. In accordance with Government Code Section 65080(b)(2)(B)(vii), the 2012-2035 RTP/SCS will achieve GHG emission reductions of eight percent per capita in 2020 (meeting the target for 2020) and 16 percent per capita in 2035 (surpassing the 13 percent reduction target for 2035).

The SCS focuses the majority of new housing and job growth in High Quality Transit Areas (HQTA) and other opportunity areas in existing main streets, downtowns, and commercial corridors, resulting in an improved jobs-housing balance and more opportunity for TOD. (An HQTA is generally a walkable transit village or corridor, consistent with the adopted RTP/SCS, that has a minimum density of 20 dwelling units per acre and is within a mile of a well-serviced transit stop with 15-minute or less service frequency during peak commute hours.) This overall land use development pattern supports and compliments the proposed transportation network that emphasizes system preservation, active transportation, and transportation demand management measures.

The 2012-2035 RTP/SCS fully integrates the two sub-regional SCSs prepared by the Gateway Cities Council of Governments (COG) and Orange County COG. **Table 2-17** shows the goals and benefits of the SCS.

TABLE 2-17: GOALS AND BENEFITS OF THE SCS	
Better Placemaking	Creating better places for people to live and work, such as walking and bicycling opportunities, varied housing options and more compact development can reduce travel time and relieve road congestion.
Lower Cost to Taxpayers and Families	Developing more compact neighborhoods and placing everyday destinations closer together can reduce the burden of development to taxpayers and reduce the everyday cost of housing and transportation for families.
Benefits to Public Health and the Environment	Better placemaking and reducing the footprint of new development will provide more opportunities for an active lifestyle and protect natural resources and greenfield sites.
Greater Responsiveness to Demographics and the Changing Housing Market	More walkable neighborhoods with varied housing options and transportation choices will be more responsive to the changes in market demand being driven by the region's demographic changes.
Improved Access and Mobility	Enhancing critical auto connections and increasing alternative transportation options can improve people's ability to move around the region and provide easy access to everyday destinations.
SOURCE: SCAG, 2012-2035 RTP/SCS, 2012.	

The RTP/SCS was built primarily from local General Plans and input from local governments, the sub-regional COGs, from the County Transportation Commissions using the Local Sustainability Planning Tool. The adopted sub-regional SCSs of the Gateway Cities COG and the Orange County COG were integrated as provided into the regional SCS. These sub-regional SCSs were developed in close collaboration with SCAG and utilize various strategies that help achieve estimated GHG reduction targets.

The strategies contained in the 2012-2035 RTP/SCS will produce benefits for the region far beyond simply reducing GHG emissions. Because it is the latest refinement of an evolving regional blueprint that SCAG has been working on since 2000, the RTP/SCS will help the region deal with many ongoing issues across a wide range of concerns, including better place-making (a process of developing locations where people can live and work that include a pleasant and convenient walking environment that reduces their reliance on their car), lowering the cost of living, improving the environment and public health, responsiveness to changes in the marketplace, and improved access and mobility.

Compass Blueprint Growth Vision. SCAG's Compass Blueprint Growth Vision, one of the first large-scale regional growth visioning efforts in the nation, is guided by four core principles, Mobility, Livability, Prosperity and Sustainability. These efforts have effectively given the region a "jump-start" in implementing this SCS. SCAG's Compass Blueprint Growth Vision seeks to integrate land use and transportation with the goal of accommodating approximately 3.89 million additional residents between 2012 and 2035, while improving mobility for all residents, fostering livability in all communities, enabling prosperity for all people, and promoting sustainability for future generations. The location of Compass Blueprint Demonstration projects is shown in **Map 2-14** located in Chapter 8.0 (Maps). Developed in close collaboration with cities throughout the region, the policies of the Vision are:

- Identify regional strategic areas for infill and investment;
- Structure the plan on a three-tiered system of centers development;
- Develop "complete communities;"
- Develop nodes on a corridor;
- Plan for additional housing and jobs near transit;
- Plan for a changing demand in types of housing;
- Continue to protect stable existing single-family areas;
- Ensure adequate access to open space and preservation of habitat; and
- Incorporate local input and feedback on future growth.

The policies at the foundation of the 2012-2035 RTP/SCS encourage changes to the urban form that improve accessibility to transit, and create more compact development, thereby yielding a number of transportation benefits to the region. These include reductions in travel time, vehicle miles traveled (VMT), vehicle hours traveled (VHT), and vehicle hours of delay. Concurrently, the plan yielded increased transit use and mode share, and all of these effects lead to both mobility and air quality improvements.

Land Use Development Pattern. The land use development pattern of the 2012-2035 RTP/SCS, which assumes a significant increase in small-lot single-family and multi-family housing will mostly occur in infill locations near transit infrastructure, in so-called HQTAs. In some cases, the land use pattern assumes that more of these housing types will be built than is currently anticipated in local general plans, and in most cases, this shift in housing type—especially the switch from large-lot to small-lot single-family homes—will occur naturally in the marketplace as developers shift to products in high demand. In 2008, 45 percent of total housing units were multi-family products. The 2012-2035 RTP/SCS projects that in 2035, 68 percent of new homes in the SCAG region will be multi-family units.

Of the 648,000 new housing units expected in 2020, 28 percent will be at a minimum 30 dwelling units per acre; and of the 1.5 million new housing units expected in 2035, 34 percent will be at a minimum 30 dwelling units per acre. In accordance with Government Code Section 65080(b)(2)(B)(ii), these projected housing densities will help the region accommodate the projected housing needs at all income levels over the life of the 2012-2035 RTP/SCS, especially housing at the lower income categories. Additionally, SCAG moves towards improving the current distribution of households by income category in the region through the allocation of projected housing needs at the local level. After the final RHNA plan is adopted in October 2012, SCAG jurisdictions will revise their Housing Elements to meet their respective allocations. The SCS's strategies will inform the development of those Housing Elements.

As significant changes occur in existing communities there is potential for "gentrification," or the displacement of lower-income residents if new development brings higher-income residents into a neighborhood. As the 2012-2035 RTP/SCS is implemented, jurisdictions in the SCAG region must be sensitive to the possibility of gentrification and work to employ strategies that can ameliorate it. One strategy is the general approach of higher-density infill development, which means that neighborhoods will be adding to the local housing stock rather than maintaining the current stock and simply changing the residential population. A second strategy is the development of permanently affordable housing, through deed restrictions or development by nonprofit developers, which will ensure that some units will remain affordable to lower income households. SCAG will work with local jurisdictions and community stakeholders to seek resources and provide assistance to address any possible gentrification effects of new development on existing communities and vulnerable populations.

The 2012-2035 RTP/SCS land use development pattern accommodates over 50 percent of new housing and employment growth in HQTAs, while keeping jurisdictional totals consistent with local input. It moves the region towards more compact, mixed-use development leading to more opportunities for walking and biking, more transit use, and shorter auto trips. The 2012-2035 RTP/SCS allocates growth according to five community types that are further subdivided into 13 development types. The 13 development types, provide for a broad range of housing types, including smaller-lot single family homes, townhomes, and multifamily condominiums and apartments. The 13 development types are as follows:

Urban Center. Urban Centers are the highest intensity places in the Southland. The most well-known would be places such as Downtown Los Angeles or high intensity corridors such as Wilshire Boulevard. These centrally located areas are jobs rich with significant amounts of employment, typically located in office towers. Housing is also typically located in towers that cater to an urban customer. These areas have the best transit service of anywhere in the region. These areas typically represent the convergence of a number of high capacity transit facilities. The Urban Center community type can be used in several parts of the region to signify high-density land uses, mixing of uses and a saturation of non-auto transport options.

City Center. City Centers are similar to urban centers. The mix of jobs to housing is similar as they too are significant employment centers. They are on average roughly one-half the intensity of urban centers. They share similar levels of transit and other non-auto infrastructure. They are likely home to one or two high capacity transit facilities and a number of bus routes. Cities such as Pasadena provide a relevant reference for the City Center community type.

Town Center. Town Centers are another highly mixed use community type. They are roughly one-third the level of intensity as found in the City Centers. They are employment centric but also provide housing opportunities that are located very close to daily services and jobs, but in a smaller town type of setting. Cities such as Ventura or Santa Monica are examples of town centers. Buildings are generally less than six stories on average. Sidewalks and bike facilities are plentiful and the areas typically benefit from one high capacity transit facility and local buses.

Suburban Center. Suburban Centers can contain a mix of uses, but may alternately have a focus leaning toward either jobs or housing with very little mix. These areas are predominately served by automobiles, but likely have bus service or in some cases commuter rail. Buildings are typically one or two stories, but in some cases will go higher when surrounded by ample landscaping. These areas do provide some travel choice, but not at the scale of the town or city centers.

Urban Residential. Urban residential areas represent high-density concentrations of housing, typically in residential towers. Because of the high number of residents these areas provide a large number of customers for business districts located nearby. Within the district there may also be pockets of shopping, restaurants and some professional services. These neighborhoods benefit from excellent transit service. They are typically situated along or near at least one high capacity transit corridor.

City Residential. City Residential neighborhoods are relatively high-density residential areas. They are typified by pre-war development patterns containing a mix of single and multi-family housing. Buildings range from one and two story bungalows to 5 or 10 story apartments and condos. Major streets in and near the neighborhood will have high frequency bus service. Jobs in these areas are limited to some home offices and small, local-serving shops and restaurants. Residents in these areas have quick access to a range of activities and job locations by foot, bike, car or transit.

Town Residential. Town Residential neighborhoods are common prewar neighborhoods where single family homes on modest lots prevail, with the some garden apartments located perhaps a block away from busier commercial streets. Townhomes, duplexes and accessory dwelling units will be interspersed, likely on corners or between apartments and single-family homes. This type of neighborhood is becoming increasingly popular in new developments. The streets in these neighborhoods are generally low volume and include full sidewalk coverage and parking on the street. They are easily navigable via car, bike or on foot. Transit service is often located within 0.25 to 0.50 miles of homes.

Suburban Residential. Suburban Residential neighborhoods are familiar to many as they have been the dominant form of housing in the SCAG region for the last several decades. These areas are the least dense form of development in the region. With larger lots and their separation from active areas these areas are sought by many. Utilizing transit often requires residents to drive to nearby park and ride facilities.

Urban Employment. Urban Employment community type is focused on jobs. At 160 jobs per acre or more, buildings are typically hi-rise with parking in structures or underground. These districts are typically located in the center of an urban core and served by multiple high capacity transit lines. These districts will draw their employees from residences located throughout the region.

City Employment. City Employment community type represents the employment core of a city. Jobs are typically in hi-rise structures with a mix of surface and structured parking. The areas are often served by one or more high capacity transit lines. These core areas are recognizable by their skyline, but do not dominate

in the same way as Downtown Los Angeles' does. They will draw workers from nearby neighborhoods and cities.

Town Employment. Town Employment community type represents the employment core of a smaller town, or an independent job node. Jobs are typically in low to mid-rise structures with mostly surface parking. The areas are often served by one high capacity transit line, or frequent bus service. They will draw workers from nearby neighborhoods and some from adjacent cities.

Suburban Employment. Suburban Employment type represents job nodes that are typically situated along major arterials or near interchanges. The job density is quite low and is likely to take the form of shopping, restaurants or services. Jobs are typically in one-story structures with surface parking. These areas are served primarily by automobiles, but may have bus access or even be located near commuter rail facilities.

Rural. Rural community type is more diverse than any of the others. While it includes both jobs and housing, the two are rarely found together. Housing is typically in acreage lots or ranchettes, often far from services or jobs. Jobs are likely to be located in isolated nodes such as rural cross-roads or highway service areas. These areas are rarely served by transit. Few people occupy these areas, but those that do are auto reliant.

In order to conduct transportation modeling for the 2012-2035 RTP/SCS, SCAG distributed the growth forecast allocation data to transportation analysis zones (TAZs) to capture localized effects of the interaction of land use and transportation.

SB 375 offers local governments potential CEQA relief for qualified development projects consistent with an adopted SCS. SCAG suggests that utilizing "development types" at the TAZ level of geography (with an average size of 160 acres) offers local jurisdictions adequate information and flexibility to make appropriate consistency findings for projects to be eligible to receive CEQA streamlining benefits.

For purposes of SCAG's SCS, a Development Type reflects an estimated average density of 22 residential units per acre. However, it is important to note that the designation is a potential ultimate average for the TAZ—and is not an absolute project-specific requirement that must be met in order to determine consistency with the SCS. In other words, the SCS was not developed with the intent that each project to be located within any given TAZ must exactly equal the density and relative use designations that are indicated by the SCS Development Type in order for the project to be found consistent with the SCS's use designation, density, building intensity and applicable policies. Instead, any given project, having satisfied all of the statutory requirements of either a residential/mixed-use project or TPP, may be deemed by the lead agency to be consistent with the SCS so long as the project does not prevent achieving the estimated average use designations, densities and building intensities indicated by the Development Type within the TAZ, assuming that the TAZ will be built-out under reasonable local planning and zoning assumptions.

The 2012-2035 RTP/SCS incorporates the overall RHNA target for the SCAG region and provides a land use pattern that shows where new housing growth can be accommodated in the future. In 2008, the SCAG region was comprised of about 17.9 million people, 5.8 million homes and 7.7 million jobs. The 2035 Integrated Growth Forecast projects that the region will grow by another 4 million people by 2035, and nearly 1.5 million households and 1.7 million jobs will be added. The Plan land use pattern contains sufficient residential capacity to accommodate the region's future growth, including the 8-year regional housing need, as shown in **Table 2-18**. As shown in **Table 2-19,** the land use pattern also encourages improvement in the jobs-housing balance by accommodating 680,000 additional jobs in 2020 and approximately 1.7 million additional jobs in 2035 (note numbers in tables below have been rounded).

Currently, SCAG is home to approximately 6 million households, 55 percent of which live in detached single-family homes. However, the changing nature of households, in particular the growth in household without children, means there will be less demand for single-family homes, especially those on large lots. As a result there is expected to be an increase in demand for small-lot single-family houses and multi-family

housing in close proximity to amenities, including local shopping and transit service. This shift is apparent in the land use development patterns of the 2012-2035 RTP-SCS. It is anticipated that in most cases, the shift in housing type will occur naturally in the marketplace as developers increase production of products in high demand. The factors described below were all considered in the land use development pattern as either incentives (HQTAs) or disincentives (resource areas) to development.

TABLE 2-18: TOTAL HOUSING UNITS FORECAST IN RTP/SCS

Community Type	Existing Housing Units (2008)	Total Forecasted Housing Units (2020)	New Housing Units (2008-2020)	Total Forecasted Housing Units (2035)	New Housing Units (2008-2035)
Urban	139,000	180,000	41,000	226,000	87,000
City	685,000	755,000	70.000	948,000	263,000
Town	2,496,000	2,760,000	264,000	3,159,000	663,000
Suburban	2,333,000	2,556,000	223,000	2,750,000	417,000
Rural	162,000	212,000	50,000	241,000	79,000
Total	**5,815,000**	**6,462,000**	**648,000**	**7,324,000**	**1,509,000**

SOURCE: SCAG, 2012-2035 RTP/SCS, 2011; Chapter 4, Sustainable Communities Strategy, Table 4.1, Page 126, 2011.

TABLE 2-19: TOTAL JOBS FORECAST IN RTP/SCS

Community Type	Existing Jobs (2008)	Total Forecasted Jobs (2020)	New Jobs (2008-2020)	Total Forecasted Jobs (2035)	New Jobs (2008-2035)
Urban	503,000	531,000	28,000	573,000	70,000
City	1,029,000	1,077,000	48,000	1,193,000	164,000
Town	2,872,000	3,098,000	226,000	3,575,000	703,000
Suburban	3,183,000	3,515,000	332,000	3,874,000	691,000
Rural	147,000	195,000	48,000	221,000	74,000
Total	**7,734,000**	**8,416,000**	**682,000**	**9,436,000**	**1,702,000**

SOURCE: SCAG, 2012-2035 RTP/SCS, 2011; Chapter, 4, Sustainable Communities Strategy, Table 4.2, Page 127, 2011.

Main Streets, Downtowns, and Corridors. The demand for smaller lots and multi-family housing often goes hand-in-hand with a desire to be close to amenities, retail, restaurants and recreation. The land use pattern places a high percentage of new housing and jobs in main streets, downtowns, and along corridors where infrastructure already exists. This geographical placement makes sense given the SCAG region's trend toward revitalization of these older, traditionally commercial areas. Such a pattern has many co-benefits, including walking access to community amenities, lower VMT, lower transportation cost for both cities and individuals, and lower overall infrastructure cost.

Resource Areas and Farmland. In identifying the overall land use pattern, the 2012-2035 RTP/SCS also considers areas that are to be protected from development, as required by Government Code Section 65080(b)(2) (B)(v). These areas, which include parklands, open space, natural resource areas, and farmland, are critical for the region's environmental and economic health. Data gathered from the sources listed below were compiled into relevant datasets and provided to local jurisdictions within the region for review and revision.

The updated information was then used to ensure the protection of resources areas in the development of the overall land use pattern:

- California Natural Diversity Database (California Department of Fish and Game)
- Flood Insurance Rate Maps (Federal Emergency Management Agency)

- Natural Community Conservation Planning Program (California Department of Fish and Game)
- California Protected Areas Database (GreenInfo)
- Farmland Mapping & Monitoring Program (Division of Land Resource Protection in California Department of Conservation)

SCAG is also developing a natural lands acquisition and open space conservation strategy to encourage large-scale acquisition and management of critical habitat to mitigate impacts, including greenhouse gas emissions, related to future transportation projects. The strategy will identify appropriate agencies with which to collaborate in order to develop a regional conservation plan based on identified priority areas.

Transit Stations and High Quality Transit Areas (HQTAs). The overall land use pattern focuses jobs and housing in the designated HQTAs, as illustrated in **Map 2-15**, located in Chapter 8.0 (Maps). A HQTA is generally a walkable transit village, consistent with the adopted SCS that has a minimum density of 20 dwelling units per acre and is within 0.5 miles of a well-serviced transit stop, and includes transit corridors with minimum 15-minute or less service frequency during peak commute hours. The 2012-2035 RTP/SCS assumes that 51 percent of new housing developed between 2008 and 2035 will be within HQTAs, along with 53 percent of new employment growth (compared with 39 and 48 percent, respectively in 2008). Aligning a high quality transit network and new housing and jobs offers Southern Californians more complete communities that offer a variety of transportation and housing choices, while reducing the negative impacts of automobile use on public health and the environment.

Transportation Network. The 2012-2035 RTP/SCS calls for an expanded transportation network that will complement the overall land use pattern's focus on locating new growth in HQTAs and other opportunity areas, which in turn allows the RTP/SCS to leverage greater improvement in transportation capacity and system operations than would otherwise be the case. Working together, these complementary land use and transportation strategies can significantly reduce VMT- a primary goal of SB 375 by increasing transit ridership, increasing walking and biking, and reducing the length of auto trips.

All of the components described above comprise the SCS and were used to develop the 2012-2035 land use pattern for the SCAG region. **Map 2-16** through **Map 2-22**, located in Chapter 8.0 (Maps), show the land use pattern for the region that was developed for the Plan. These maps show the regional distribution, as well as the county level land use distributions.

Regional Housing Needs Assessment (RHNA). SB 375 combines transportation and housing planning by integrating the RHNA process with the 2012-2035 RTP/SCS. Specifically, Government Code Section 65080(b)(2)(B), subparagraphs (iii) and (vi), require that the SCS identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region and consider the state housing goals specified in Government Code Sections 65580 and 65581.

The SCAG region's official regional housing need from the California Department of Housing & Community Development (HCD) for the planning period 2014–2021 is 409,000–438,000 housing units. Of these, approximately 164,000–176,000 are expected to be in the very low- and low-income category (affordable to those who make less than 80 percent of area median income), 72,000–77,000 are expected to be in the moderate-income category (affordable to those who make between 80 percent and 120 percent of median income), and 173,000–185,000 are expected to be offered at above moderate-income category.

The 2012-2035 RTP/SCS incorporates the overall RHNA target for the SCAG region and provides a land use pattern that shows where new housing growth can be accommodated in the future. In 2008, the SCAG region was comprised of about 17.9 million people, 5.8 million homes and 7.7 million jobs. The 2035 Integrated Growth Forecast projects that the region will grow by another 4 million people by 2035, and nearly 1.5 million households and 1.7 million jobs will be added. The 2012-2035 RTP/SCS land use pattern contains sufficient residential capacity to accommodate the region's future growth, including the 8-year regional housing need. The land use pattern accommodates approximately 648,000 additional housing units in the

SCAG region in 2020, and over 1.5 million additional housing units in 2035. The land use pattern also encourages improvement in the jobs-housing balance by accommodating 680,000 additional jobs in 2020 and approximately 1.7 million additional jobs in 2035.

Chapter 5: Measuring Up

Environmental Justice

The concept of environmental justice is about equal and fair access to a healthy environment, with the goal of protecting underrepresented and poorer communities from incurring disproportionate environmental impacts. Consideration of environmental justice in the transportation planning process stems from Title VI of the Civil Rights Act of 1964. Title VI of the Civil Rights Act of 1964 establishes the need for transportation agencies to disclose to the public the benefits and burdens of proposed projects on minority populations. The understanding of civil rights has expanded to include low-income communities. In addition to Federal requirements, SCAG must comply with California Government Code Section 11135, which 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." **Table 2-20** lists the demographic categories that are used in SCAG's Environmental Justice analysis.

TABLE 2-20: DEMOGRAPHIC CATEGORIES

Ethnic/Racial/Other Categories (persons)	Income Categories (households)
White (Non-Hispanic)	Below Poverty Level
African-American	Income Quintile 1 (lowest)
American Indian	Income Quintile 2
Asian/Pacific Islander	Income Quintile 3
Hispanic (Latino)	Income Quintile 4
Other Racial Categories	Income Quintile 5
Disabled/Mobility Limited	
Age 65 and Above	
Non English speaking	
Without High School Diploma	
Household without a car	
Foreign born population	
Sensitive Receptors: hospitals, daycare facilities, schools, senior centers, parks/open space	

SOURCE: SCAG 2012-2035 RTP/SCS, Environmental Justice Report, Page 5, 2011.

FHWA and the FTA have a commitment to assuring environmental justice in the programs they fund. Both of these federal agencies recently issued proposed revised planning regulations regarding environmental justice. This was done in part to comply with Title VI of the Civil Rights Act of 1964 and associated regulations and policies, including President Clinton's 1994 Executive Order 12898 on Environmental Justice. Generally these laws prohibit discrimination on the basis of race, income, age, or disability. On August 4, 2011, seventeen federal agencies signed the "Memorandum of Understanding on Environmental Justice and Executive Order 12898." The signatories, including the U.S. Department of Transportation, agreed to develop environmental justice strategies to protect the health of people living in communities overburdened by pollution and provide the public with annual progress reports on their efforts. In the transportation-planning context, SCAG's role is to ensure that when transportation decisions are made, low-income and minority communities have ample opportunity to participate in the decision-making process and that they receive an equitable distribution of benefits and not a disproportionate share of burdens. A detailed

methodology and analysis of environmental justice is contained in Chapter 5 of the 2012-2035 RTP/SCS and a corresponding Environmental Justice Appendix.

SCAG's environmental justice program includes two main elements: public outreach and technical analysis. The public outreach efforts are intended to assure that all members of the public have an opportunity to participate meaningfully in the planning process. SCAG held two environmental justice workshops and convened focus groups on the environmental justice analysis to ensure that all members of the public have an opportunity to participate meaningfully in the planning process. As a result of these workshops, new issues such as impacts from rail transportation, gentrification and displacement, pollution exposure along heavily traveled corridors, and impacts from revenue generating mechanisms such as congestion pricing were raised and are addressed in the 2012-2035 RTP/SCS.

The Environmental Justice Appendix to the 2012-2035 RTP/SCS identifies impacts to Environmental Justice communities in a number of subject areas also analyzed in this PEIR, including but not limited to Air Quality (including health effects discussed in the Air Quality impact analysis), Noise, and Transportation. However, the PEIR analyzes impacts from the Plan on the community as a whole, and not with respect to specific community groups. Nevertheless, the analysis included in this PEIR was performed consistently where possible with the Environmental Justice analysis. For informational purposes, sections of this PEIR indicate that there is information concerning impacts to low-income, minority and other protected groups included in the Environmental Justice section of the Plan and the associated appendix. For example, maps developed related to air and noise impacts are included in both documents. The Environmental Justice analysis includes subject areas not addressed by CEQA and therefore not included in the PEIR such as identification of impacts to socio-economic, minority and other protected groups. In general, readers interested in analysis of disproportionate impacts by socio-economic and other protected groups are directed to Chapter 5 and the Environmental Justice Appendix of the 2012-2035 RTP/SCS.

The Environmental Justice Appendix also includes a framework of mitigation approaches that can be applied by project sponsors to reduce impacts on protected communities. A particular effort has been made to coordinate this mitigation framework with the Mitigation Measures identified in this PEIR, including specifying like measures where applicable.

Public Health

The 2012-2035 RTP/SCS places a substantial emphasis on public health. Public health is affected by the Plan in several ways, notably through its impact on the total level of air emissions, the exposure of the population to those emissions as a function of their location, and opportunities for physical activities including active transportation and recreation.

Under the Plan criteria pollutant emissions will be reduced or stay the same as existing conditions and will be less than the No Project Alternative, with the exception of re-entrained roadway dust which is a function of total vehicle miles travelled and therefore under the Plan would be greater than existing but less than the No Project Alternative. This improvement is a result of increased emissions controls over the planning horizon, in addition to operational efficiencies and improvements as a result of the Plan itself. The improvements associated with the Plan include a greater mode split for walking, biking, and transit, and result from Plan strategies such as transit expansion and improved transportation/land use coordination.

The Plan dramatically increases the opportunities for active transportation and access to recreation. The total regional expenditure for walk and bike infrastructure improvements for the 2012-2035 RTP/SCS is $6 billion, more than triple the amount for the 2008 Plan. In addition, urban form improvements featured in the SCS will leverage the system improvements for active transportation by allowing for a greater number of communities that are well suited to walking and biking. Analysis of the benefits of this system improvement can be found in the PEIR in the Transportation section as well as in Chapter 4 Alternatives. Of note, the Plan

achieves a saving of 24 percent in costs associated with respiratory health incidences compared with the existing conditions, based on estimation through the Rapid Fire model.

The 2012-2035 RTP/SCS also contains substantial Environmental Justice analysis (the Environmental Justice component of the Plan is summarized above), which has a focus on cancer risk and respiratory hazard in protected communities. The Environmental Justice component of the Plan analyses emissions exposure, health risk, access to recreational opportunities and other parameters with respect to groups protected by Environmental Justice regulations and guidelines. Readers interested in analysis of potential disproportionate impacts by socio-economic and other protected groups are directed to Chapter 5 of the Plan, as well as the Plan's Environmental Justice Appendix. Analyses contained within the Environmental Justice portions of the Plan that pertain to impacts on the physical environment to the community as a whole are addressed in this PEIR.

Finally, the PEIR contains a Screening Level Health Risk Assessment, summarized in the Air Quality section and included in Appendix F, which quantifies cancer risk associated with exposure to mobile source emissions at eight locations in the region. The methodology for the Screening Level Health Risk Assessment was designed to evaluate risk at locations exposed to some of the highest mobile source emissions in the region, in particular diesel particulate matter (DPM) associated with high levels of goods movement activity. The Air Quality analysis and Screening Level Health Risk Assessment conclude that while cancer risk remains high in locations adjacent to freeways, it would decrease substantially as compared to existing conditions. Therefore, the PEIR concludes that in concert with other regulations the Plan improves health outcomes compared to current conditions due to the introduction of stricter emission controls during the plan period in addition to some decline in emissions associated with efficiency improvements to the goods movement system. The Air Quality analysis also identifies that Plan policies designed to concentrate growth would result in more people living near transportation facilities than under existing conditions. It includes a mitigation measure to address this impact.

2.4 PROPOSED PLAN AND RTP/SCS PEIR ALTERNATIVES

Each of the alternatives evaluated in the 2012-2035 RTP/SCS PEIR includes a collection of transportation projects and strategies or transportation network and a growth scenario. The alternatives evaluated for the 2012-2035 RTP/SCS PEIR are as follows:

1. The **2012-2035 RTP/SCS** (Plan or Project), which includes all of the elements summarized above, contains transportation/urban form strategies that encourage compact growth, increased jobs/housing balance, and development located in centers with a mix of uses designed to reduce vehicle trips and trip lengths, where feasible, in all parts of the region. The elements described above comprise the Plan network and the Plan growth scenario.

2. The **No Project Alternative** includes only those transportation projects that are under construction, undergoing right-of-way acquisition included in the first year of the previously conforming transportation plan and/or TIP, or have completed environmental review by December 2010. These reasonably foreseeable projects fulfill the definition of the CEQA-mandated "No Project Alternative." The growth scenario included in the No Project Alternative is based on 2008 RTP local input which was then adjusted to reflect 2012-2035 RTP/SCS regional population, housing and jobs totals.

3. The **2008 Modified RTP Alternative** is an update of the adopted 2008 RTP to reflect the most recent growth estimates and transportation planning decisions and assumptions. This alternative does not include urban form strategies included within SCS, but includes all of the modifications and projects in the 2008 RTP through RTP Amendment 4. The growth scenario for the 2008 Modified RTP Alternative is a combination of local input and existing general plan and land use data provided by local jurisdictions.

4. The **Envision 2 Alternative** builds on the enhanced density and ideas of the SCS as described in the Plan and goes further. It includes far more aggressive densities than the 2012-2035 RTP/SCS, especially around HQTAs, increases mobility, reduces emissions, and limits the development of single-family housing that would be built in the region. The Envision 2 transportation network is similar to the Plan network with minor changes to goods movement and transit projects. The growth network associated with Envision 2 maximizes urban centers, TODs and HQTAs. It also includes a more progressive jobs/housing distribution optimized for TOD and infill.

2.5 RELATIONSHIP TO OTHER EIRS

The 2012-2035 RTP/SCS PEIR builds on the analysis and mitigation contained in the 2008 RTP PEIR. The 2012-2035 RTP/SCS project list is similar to the project list for the 2008 RTP, although some of the transportation projects from the 2008 RTP are now considered committed and are included in the No Project Alternative. The 2012-2035 RTP/SCS PEIR evaluates the most recent projects and policies and provides more direct comparisons between current conditions and expected future Plan conditions. The 2012-2035 RTP/SCS PEIR includes additional analysis of cumulative, growth-inducing and other indirect impacts.

2.6 INTENDED USES OF THE PEIR

SCAG will use this PEIR as part of its review and approval of the 2012-2035 RTP/SCS. The lead agencies for individual projects may use this PEIR as the basis of their regional and cumulative impacts analysis. In addition, for projects that may be eligible for CEQA Streamlining, applicable mitigation measures from this EIR shall be incorporated into those projects as appropriate. It is the intent of SCAG that member agencies and others use the information contained within the PEIR in order to "tier" subsequent environmental documentation of projects in the region. Information from this document may also be incorporated in future County Congestion Management Programs and associated environmental documents, as applicable.

The 2012-2035 RTP/SCS is intended to meet the changing socioeconomic, transportation infrastructure, financial, technological and environmental conditions of the region. Individual projects are preliminarily identified in the 2012-2035 RTP/SCS; however, this PEIR is programmatic in nature and does not specifically analyze these projects. Project-level analysis will be prepared by implementing agencies on a project-by-project basis. Project-specific planning and implementation undertaken by each implementing agency will depend on a number of issues, including: policies, programs and projects adopted at the local level; restrictions on federal state and local transportation funds; the results of feasibility studies for particular corridors; and further environmental review of proposed projects.

3.0 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

This chapter generally describes the regulatory framework and reviews the environmental setting for each issue area. Based on the regulatory context and existing setting, potentially significant environmental impacts that could result from implementation of the Plan are analyzed and identified. These potential impacts are analyzed for the following environmental issues: aesthetics; air quality; biological resources and open space; cultural resources; geology, minerals, and seismicity; greenhouse gas emissions; hazards and hazardous materials; land use and planning; noise; population, housing and employment; transportation, traffic and security; and public services and utilities. Discussion of potential impacts is focused on the identification of changes that may be considered to be environmentally significant (a substantial, potentially substantial, or adverse change in the environment) relative to the existing environmental conditions.

Analysis of each environmental issue is organized into the following subsections:

REGULATORY FRAMEWORK – An identification of applicable federal, State and local regulations.

EXISTING SETTING – A description of existing conditions that precede implementation of the proposed project.

THRESHOLDS OF SIGNIFICANCE – The criteria by which the project components are measured to determine if the proposed project would cause a substantial or potentially substantial adverse change in the existing environmental conditions. This section also includes a discussion of the methodology used to determine impacts, where appropriate.

IMPACTS – An analysis of the beneficial and adverse effects of the proposed project, including, where appropriate, assessments of the significance of potential adverse impacts, including cumulative impacts, relative to established thresholds (relative to existing conditions per CEQA).

MITIGATION MEASURES – Whenever significant impacts relative to existing conditions are identified, mitigation measures are recommended to avoid or minimize impacts to the extent feasible.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION – A discussion of whether a significant and unavoidable impact would be reduced to a less-than-significant level after mitigation under CEQA, or remain significant and unavoidable.

COMPARISON WITH THE NO PROJECT ALTERNATIVE – A comparison of the expected future conditions of the proposed Plan to the expected future conditions if no Plan were adopted. This evaluation is not included in the determination of the significance of impacts; however it provides valuable information on the effects of the 2012-2035 RTP/SCS.

3.1 AESTHETICS

This section describes the aesthetics and views in the SCAG region, identifies the potential impacts of the RTP on these resources, includes mitigation measures for the impacts, and evaluates the residual impacts.

REGULATORY FRAMEWORK

The regulatory setting describes the federal, State, and local agencies that have jurisdiction over aesthetics and views. The regulations pertinent to aesthetics and views that each of these agencies enforce are also described in this section.

Federal

Federal Highway Administration (FHWA) National Scenic Byways Program. The FHWA National Scenic Byways Program designates selected highways as "All American Road" (a roadway that is a destination unto itself) or "National Scenic Byway" (a roadway that possesses outstanding qualities that exemplify regional characteristics).

United States Bureau of Land Management (BLM) Scenic Areas. The BLM designates some of its holdings as Scenic Areas and some roadways in remote areas as Back Country Byways. The counties of San Bernardino, Riverside, and Imperial in the SCAG region include land with such BLM designations.

United States Forest Service (USFS) National Scenic Byways Program. The USFS also has a National Scenic Byways Program, independent from the BLM program, to indicate roadways of scenic importance that pass through national forests. The SCAG region includes Forest Service Scenic Byways in the counties of San Bernardino, Ventura, Los Angeles, and Riverside.

State

California Department of Transportation (Caltrans) California Scenic Highways Program. The California Scenic Highways Program was created by the State legislature in 1963 to preserve and protect scenic highway corridors from change that would reduce the aesthetic value of lands adjacent to highways. To be included in the state program, the highways proposed for designation must meet Caltrans' eligibility requirements and have visual merit. County highways and roads that meet the Caltrans Scenic Highways Program standards may also be officially designated.

Local

For the most part, local planning guidelines have been developed in General Plans to preserve and enhance the visual quality and aesthetic resources of urban and natural areas. As discussed in the Land Use section of this document, zoning codes implement the goals and objectives of General Plans. The value attributed to a visual resource generally is based on the characteristics and distinctiveness of the resource and the number of persons who view it. Vistas of undisturbed natural areas, unique or unusual features forming an important or dominant portion of a viewshed, and distant vistas offering relief from less attractive nearby features are frequently considered to be scenic resources. In some instances, a case-by-case determination of scenic value may be needed, but often there is agreement within the relevant community about which features are valued as scenic resources.

In addition to state designations, cities and counties have their own scenic highway designations, which are intended to preserve and enhance existing scenic resources. Criteria for designation are commonly included in the Conservation/Open Space element of the city or county General Plan. Cities and counties can use open space easements as a mechanism to preserve scenic resources, if they have adopted open-space plans, as provided by the Open Space Easement Act of 1974 and codified in California Government Code, Section 51070 et seq. According to the Act, a city or county may acquire or approve an open-space easement through a variety of means, including using public money.

EXISTING SETTING

To provide context for the analysis presented below, a discussion of general definitions is necessary. Terms to be discussed include "viewsheds" and "visual quality," both key factors that encompass regionally significant aesthetics and views. The environmental setting also describes those resources that are regionally significant and lists the designated scenic highways, byways, and vista points.

Viewshed

A viewshed is a geographic area composed of land, water, biotic and/or cultural elements that may be seen from one or more viewpoints and has inherent scenic qualities and/or aesthetic value as determined by those who view it. The extent of a viewshed can be limited by a number of intervening elements, including trees and other vegetation, built structures, or topography such as hills and mountains.

Visual Quality

Visual quality refers to the character of the landscape which generally gives visual value to a setting.[1,2] Various jurisdictions within the SCAG region, such as cities, counties, and federal or regional agencies, provide guidelines regarding the preservation and enhancement of visual quality in their plans or regulations.[3] An example of such guidance is the Caltrans Scenic Highway Visual Quality Program Intrusion Examples which are presented in **Table 3.1-1**. As that table illustrates, a given visual element may be considered desirable or undesirable, depending on design, location, use, and other considerations. Because of the size and diversity of the SCAG region, it is not possible or appropriate to apply uniform standards to all areas within the region.

[1]Federal Highways, "Visual Impact Assessments for Highway Projects," accessed online June 2011 *http://www.dot.ca.gov/ser/downloads/visual/FHWAVisualImpactAssmt.pdf.*

[2]The term "visual quality" is used synonymously with "scenic quality" in this document.

[3]California cities and counties are not required to include visual quality elements in their General Plans, although many do. However, the General Plans are required to include a Conservation Element, which includes resources such as waterways and forests that frequently are also scenic resources.

TABLE 3.1-1: CALTRANS SCENIC HIGHWAYS PROGRAM: EXAMPLES OF VISUAL QUALITY INTRUSIONS

Land Use Type	Minor Intrusion	Moderate Intrusion	Major Intrusion
Buildings: Residential, Commercial, Industrial Development	Widely dispersed buildings. Natural landscape dominates. Wide setbacks and buildings screened from roadway. Exterior colors and materials are compatible with environment. Buildings have cultural or historical significance.	Increased number of buildings, but are complimentary to the landscape. Smaller setbacks and lack of roadway screening. Buildings do not degrade or obstruct scenic view.	Dense and continuous development. Highly reflective surfaces. Buildings poorly maintained. Visible blight. Development along ridge lines. Buildings degrade or obstruct scenic view.
Unsightly Land Uses: Dumps, Quarries, Concrete Plants, Tank Farms, Auto Dismantling	Screened from view so that facility is not visible from the highway.	Not screened from view and visible but programmed/funded for removal and site restoration.	Not screened from view and visible by motorists. Will not be removed or modified. Scenic view is degraded.
Strip Malls		Neat and well landscaped. Blend with surroundings	Not harmonious with surroundings. Poorly maintained or vacant. Blighted, Development degrades or obstructs scenic view.
Parking Lots	Screened from view so that vehicles and pavement are not visible from the highway	Neat and well landscaped. Blend with surroundings	Not screened or landscaped. Scenic view is degraded.
Off-Site Advertising Structures			Billboards degrade or obstruct scenic view.
Noise Barriers		Noise barriers are well landscaped and complement the natural landscape. Noise barriers do not degrade or obstruct views.	Noise barriers obstruct scenic view.
Power Lines	Not easily visible from road.	Visible, but compatible with surroundings	Poles and lines dominate view. Scenic view is degraded.
Agriculture: Structures, Equipment, Crops	Blends in and complements scenic view. Indicative of regional culture.	Not in harmony with surroundings. Competes with natural landscape for visual dominance.	Incompatible with and dominates natural landscape. Structures equipment or crops degrade scenic view.
Exotic Vegetation	Used as screening and landscaping. Blends in and complements scenic view.	Competes with native vegetation for visual dominance.	Incompatible with and dominates natural landscape. Structures equipment or crops degrade scenic view.
Clearcutting		Tress bordering highway remains so that clearcutting is not evident.	Clearcutting or deforestation is evident. Scenic view is degraded.
Erosion	Minor soil erosion.	Slopes beginning to erode. Not stabilized.	Large slope failures and no vegetation. Scenic view is degraded.
Grading	Grading blends with adjacent landforms and topography.	Some changes, but restoration is taking place.	Extensive cut and fill. Scarred hillsides and landscape. Canyons filled in. Scenic view is degraded.
Road Design	Blends in and complements scenic view. Roadway structures are suitable for location and compatible with surroundings.	Cut and fill is visible but has vegetative cover.	

SOURCE: Caltrans. Scenic Highways Program, 1996.

Aesthetically Significant Resources

Aesthetically significant resources can be found throughout the SCAG region, ranging in character from urban centers, to rural agricultural lands, to natural woodlands to mountains and canyons to lakes and waterways, to beaches and the Pacific Oceans. The extraordinary range of visual features in the region is afforded by the mixture of climate, topography, and flora and fauna found in the natural environment as well as the diversity of style, composition, and distribution of the built environment. Natural features include land and water resources such as parks and open areas, wilderness areas, beaches, and natural water resources. Man-made lakes are included as elements of the visual environment that have been constructed to resemble natural features. The loss of natural aesthetic features, reduction of vistas, or the introduction of contrasting urban features may diminish the value of natural resources in the region. Views of the coast from locations in Ventura, Los Angeles and Orange Counties are considered valuable visual resources. Views of various mountain ranges are also widely prevalent throughout the region. Rivers, streams, creeks, lakes and reservoirs located in the region may also be visually significant. Features of the built environment that may also have visual significance include individual or groups of structures that are distinctive due to their aesthetic, historical, social, or cultural significance or characteristics. Examples of the built environment that may be visually significant include bridges or overpasses, architecturally appealing buildings or groups of buildings, landscaped freeways, and a location where a historic event occurred.

Designated Scenic Highways, Byways, and Vista Points

The roadways that have been designated in the SCAG region as State Scenic Highways are portions of the State Routes (SRs) listed below in **Table 3.1-2**. They also are shown in **Map 3.1-1** which is located in Chapter 8 (Maps).

TABLE 3.1-2: OFFICIALLY DESIGNATED STATE SCENIC HIGHWAYS

Route	County	Location	Miles
2	Los Angeles	From three miles north of SR-210 (at La Canada) to San Bernardino County Line	55
33	Ventura	From six miles north of SR-150 to Santa Barbara County Line	6.4
38	San Bernardino	From east of South Fork Campground to 2.9 miles south of SR-18 at State Line	16
62	Riverside	From SR-10 north to the San Bernardino County Line	9
74	Riverside	From west boundary of the San Bernardino National Forest to SR-111 in Palm Desert	48
243	Riverside	From SR-74 to the Banning city limit	28
91	Orange	From SR-55 to east of Anaheim city limit	4

SOURCE: Caltrans, officially designated state scenic highways, accessed online July 2011 *http://www.dot.ca.gov/hq/LandArch/scenic_highways/*, accessed July 27, 2011

The roadways in the SCAG region that are *eligible* to be designated as State Scenic Highways are listed in **Table 3.1-3**.

TABLE 3.1-3: ROADWAYS ELIGIBLE FOR STATE SCENIC HIGHWAY DESIGNATION

Route	County	Location	Miles
1	Orange/Los Angeles	I-5 SO San Juan Cap./SR-19 Nr Long Beach	0.0-3.6
1	Los Angeles/Ventura	SR-187 Nr Santa Monica/SR-101 Nr El Rio	32.2-21.1
2	Los Angeles/San Bernardino	SR-210 in La Can. Flintridge/SR-138 Via Wrtwd	22.9-6.36
5	San Diego/Orange	Opposite Coronado/SR-74 Nr San Juan Cap	R14.0-9.6
5	Los Angeles	I-210 Nr Tunnel Station/SR-126 Nr Castaic	R44.0-R55.5
8	San Diego/Imperial	Sunset Cliffs/SR-98 Nr Coyote Wells	T0.0-R10.0
10	San Bernardino/Riverside	SR-38 Nr Redlands/SR-62 Nr Whitewater	30.9-29.7
15	San Diego/Riverside	SR-76 Nr San Luis Rey River/SR-91 Nr Corona	R 46.5-41.5
15	San Bernardino	SR-58 Nr Barstow/SR-127 Nr Baker	76.9-R136.6
18	San Bernardino	SR-138 Nr Mt Anderson/SR-247 Nr Lucerne Valley	R17.7-73.8
27	Los Angeles	SR-1/Mulholland Dr.	0.0-11.1
30	San Bernardino	SR-330 Nr Highlands/SR-10 Nr Redlands	T29.5-33.3
33	Ventura	SR-101 Nr Ventura/SR150	0.0-11.2
33	Ventura/Santa Barbara/ San Luis Obispo	SR-150/SR-166 in Cuyama Valley	11.2-11.5
38	San Bernardino	SR-10 Nr Redlands/SR-18 Nr Fawnskin (All)	0.0-49.5
39	Los Angeles	SR-210 Nr Azusa/SR-2	14.1-44.4
40	San Bernardino	Barstow/Needles	0.0-154.6
57	Orange/Los Angeles	SR-90/SR-60 Nr City of Industry	19.9-R4.5
58	Kern/San Bernardino	SR-14 Nr Mojave/I-15 Nr Barstow	112.0-R4.5
62	Riverside/San Bernardino	I-10 Nr Whitewater/Arizona SL (All)	0.0-142.7
71	Riverside	SR-91 Nr Corona/SR-83 NO Corona	0.0-G3.0
74	Orange/Riverside	I-5 Nr San Juan Capistrano/I-111 (All)	0.0-R96.0
78	San Diego/Imperial	SR-79 Nr Sysabel/SR-86 Passing Nr Julian	51.1-13.2
79	San Diego/Riverside	SR-78 Nr Santa Ysabel/SR-371 Nr Aguanga	20.2-2.3
91	Orange/Riverside	SR-55 Nr Santa Ana Canyon/I-15 Nr Corona	R9.2-7.5
91	Orange	SR-55/E CiL Anaheim	R9.2-13.4
101	Los Angeles/Ventura/ San Bernardino/San Luis Obispo	SR-27 (Topanga Canyon Blvd) SR-46 Nr Paso Robles	25.3-57.9
111	Imperial/Riverside	Bombay Beach-Salton Sea SP/SR-195 Nr	57.6-18.4
111	Riverside	SR-74 Nr Palm Desert/I-210 Nr Whitewater	39.6-R63.4
118	Ventura/Los Angeles	SR-23/Desoto Ave. Nr Browns Canyon	17.4-R2.7
126	Ventura/Los Angeles	SR-150 Nr Santa Paula/I-5 Nr Castaic	R12.0-0R5.8
127	San Bernardino/Iny	I-15 Nr Baker/Nevada SI (All)	L0.0-49.4
138	San Bernardino	SR-2 Nr Wrightwood/SR-18 Nr Mt Anderson	6.6-R37.9
142	San Bernardino	Orange CL/Peyton Dr.	0.0-4.4
150	Santa Barbara/Ventura	SR-101 Nr Ventura/SB CL/SR-126 Nr Santa	0.0-34.4
173	San Bernardino	SR-138 Nr Slvrwd Lk/SR-18 SO lk Arwhd (All)	0.0-23.0
210	Los Angeles	I-5 Nr Tunnel Station/SR-134	R0.0-R25.5
215	Riverside	SR-74 Nr Romoland/SR-74 Nr Perris	23.5-26.3
243	Riverside	SR-74 Nr Mountain Cntr/I-210 Nr Banning (All)	0.0-29.7
247	San Bernardino	SR-62 Nr Yucca Valley/I-15 Nr Barstow (All)	0.0-78.1

SOURCE: Caltrans, officially designated state scenic highways, accessed online August 2011 *http://www.dot.ca.gov/hq/LandArch/scenic_highways/*, accessed July 27, 2011

In addition to State Scenic Highways, there are ten Caltrans-designated vista points in the SCAG region, as listed in **Table 3.1-4** below.

TABLE 3.1-4: CALTRANS DESIGNATED VISTA POINTS

County	Name	Route	Post Mile
Los Angeles	Lamont Odett Scenic Vista Point	14	57.8
Riverside	Windmill Vista Point	10	30.8
Riverside	Coachella Valley	74	87.6
Riverside	Indian Hill Road	243	13.8
San Bernardino	Donald S. Wieman Vista Point	18	21.4
San Bernardino	Bear Valley Dam	18	44.2
San Bernardino	Mill Creek	38	10.7
San Bernardino	Eyes of the World	38	14.2
San Bernardino	Silverwood Lake	138	3.6
San Bernardino	Silverwood Lake	138	25.3

SOURCE: Lori Butler, Caltrans Roadside Facilities Coordinator, Personal communication August 3, 2011.

Urban Transportation Features

Elements of the transportation infrastructure, including roadways, freeways, bridges, and railroads are a large component of the urban environment and have an effect on the visual environment. A discussion of these components is provided below.

Freeways, Highways, and Roadways. In urban areas, roadway rights-of-way comprise approximately 20 to 30 percent of the total land area. Because most vehicular movement occurs along transportation corridors, their placement largely determines what parts of the SCAG region will be seen by persons traveling in the area. In the SCAG region, arterials and freeways comprise a major component of the existing visual environment. The visual character of freeways themselves depends on the scale at which observers view them; above and from a distance, freeway traffic forms a compelling contribution to the scenery, whether by lights moving at night or by the changing visual character of daytime traffic. From below and at close range, freeways are often barriers to views of near and distant scenery. Arterials and freeways comprise a major component of the existing visual environment of the region. Arterials in the SCAG region offer a variety of visual experiences from the uncrowded, narrow winding roads in mountain areas to the high-volume urban streets in the densely populated areas of Los Angeles and Orange Counties. Many arterials have been built connecting urban concentrations with natural areas with key scenic resources. Examples include:

- The Pacific Coast Highway 1 (PCH) traverses the entire coastal side of the SCAG region. Proceeding northward, PCH enters the region at Dana Point in Orange County and follows the shoreline of the Pacific Ocean, illuminating its beaches and rugged cliffs, through Los Angeles and Ventura Counties where it continues on to Northern California.
- The 50-mile Santa Monica Mulholland Scenic Corridor runs westward from the Hollywood Freeway (U.S. 101), winding its way through the Santa Monica Mountains to Leo Carillo State Beach in Malibu.
- The 15-mile Palos Verdes Scenic Drive begins at Palos Verdes Estates and goes to Point Fermin Park in the community of San Pedro. The cliff top section of the road offers many scenic views.

In addition, county and local roads in foothill and mountain areas also afford panoramic views throughout the region. Examples of areas with these types of views include:

- Los Angeles County: Santa Monica Mountains, San Gabriel Mountains, Verdugo Mountains, Santa Susana Mountains (also in Ventura County), San Jose Hills, Puente Hills
- Orange County: San Joaquin Hills, Anaheim Hills, and Santa Ana Mountains
- Riverside County: San Jacinto Mountains.

- San Bernardino County: Chino Hills and San Bernardino Mountains
- Ventura County: Simi Hills, Santa Susana Mountains, Santa Monica Mountains

Mountainous portions of Imperial County are not generally accessible from county roads. Large areas in the Chocolate Mountains are owned by the military and are not accessible to civilians.

Trains. Passenger rail operations (i.e., Amtrak, Metrolink, Metro) occupy existing railroad tracks and right-of-way areas and generally limited in terms of routes and overall passengers served. Except in predominately residential areas, the view of passenger trains (at-grade or elevated guideways) is not generally considered visually offensive to most viewers. Conversely, passenger rail operations afford riders a variety of views. In Ventura County, for example, Amtrak provides scenic views of the coastline and adjacent mountains. Because of their prevalence in the urban core at relatively low elevations, passenger rail operations in the SCAG region provide accessible views of scenic resources comparable to those associated with freeways, highways and roadways.

Freight railroads and associated rail yards are often considered to have a negative aesthetic impact in many urban communities. This perception is largely due to graffiti associated with rail cars and rail yards, unsightly building facilities, and viewshed blockage. Additional factors include building scale and utilitarian architectural style, visual intrusiveness on surrounding land uses, and community context (i.e., predominately industrial vs. residential uses). Negative opinions are particularly acute within adjacent residential communities. Views of freight railroads (i.e. rail cars) and rail yard facilities are largely limited, due in part, to topography, security fencing and limits on operation within urban communities. However, some facilities are visible from adjacent roadways, along freeways, highways, railroad right-of-ways, and hillside areas. Railyard facilities within the SCAG region are predominately located within industrial core areas and include the Port of Los Angeles, Long Beach, East Los Angeles, Hobart, City of Industry (Los Angeles County), West Colton, and Burlington Northern/Santa Fe (BNSF) (San Bernardino County). Additional freight facilities are also located in less densely populated areas such as Barstow and Yermo (San Bernardino County).

Airports. The SCAG region includes numerous airports serving both commercial and private airplane flights. Major commercial airports in the region include Los Angeles International Airport, Palmdale Airport, Long Beach Airport, and Burbank Airport in Los Angeles County; John Wayne Airport in Orange County; Ontario International Airport, San Bernardino International Airport, and Southern California Logistics Airport in San Bernardino County; and Palm Springs International Airport and March Inland Port in Riverside County. From an aesthetic resources standpoint, the proximity of aviation facilities to residential areas is considered to have a negative impact due to the industrial nature of aviation facilities and their attraction of related industrial uses including warehousing and freight-based businesses. Direct views of aviation operations at airports, views of takeoffs and landings, and the prevalence of trucks and vehicular congestion near aviation facilities all contribute to the perceived negative aesthetic effects of airports on residential areas.

Within the SCAG region, proximal views of takeoffs and landings of large commercial aircraft occur near all major commercial airports. Proximal, but temporary, passing views of aviation facilities and airport operations are also prevalent from highways and major arterials serving these facilities. Near LAX, residents of Inglewood, El Segundo, Playa del Rey and Westchester are exposed to these types of views. Residential areas in Palmdale, Lancaster and unincorporated Los Angeles County are proximal to flights at the Palmdale facility. Long Beach and Signal Hill residents have views of takeoffs and landings at the Long Beach Airport. Residents in Tustin, Newport Beach, Irvine, and Costa Mesa are located in proximity to the John Wayne Airport. Residential and resort housing is located close to the Palm Springs Airport. Moreno Valley and Riverside residents have the closest views of flights from March Inland Port. Residential areas in San Bernardino, Colton and Redlands have views of flights at the San Bernardino International Airport. Ontario residents have the closest views of flights from the Ontario International Airport. Victorville residents have the closest views of flights from the Southern California Logistics Airport.

To a lesser degree, similar conditions are experienced near general aviation facilities throughout the region although air traffic is considerably less than at commercial aviation facilities. In general, there is a great deal less air traffic and therefore less population exposed to this traffic at general aviation facilities than near commercial facilities. However, several general aviation facilities (e.g., Santa Monica, Hawthorne) are located near urban residential areas.

Ports. The adjacent shipping ports of Los Angeles and Long Beach represent the major shipping location in the SCAG region and also one of the most important shipping locations in the United States. Proximity to rail and air transport facilities increases the utility and importance of these ports. Because of security and safety concerns, ports generally block public access to the waterfront within the Port, limiting visual access as well. However, provisions of the California Coastal Act provide for public access to the coast elsewhere in the SCAG region.

Port facilities in Los Angeles and Long Beach offer views of container terminals, cranes, other types of loading equipment and ships carrying cargo in and out of the ports. Operations in the Port of Los Angeles are visible in portions of the San Pedro area (City of Los Angeles). Port facilities in Long Beach are widely visible from downtown Long Beach, portions of West Long Beach, and along the shoreline south of downtown. Port of Long Beach facilities are also visible from two of the City's major tourist attractions along Queensway Bay: the Queen Mary and the Aquarium of the Pacific.

THRESHOLDS OF SIGNIFICANCE

Based on CEQA Guidelines Appendix G and as appropriate for the 2012-2035 RTP/SCS, the Plan would have a significant impact if implementation would:

- Substantially degrade the existing visual character or quality of the site and its surroundings;
- Substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway; and/or
- Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

In addition, the following threshold is applied based on precedent and appropriateness to the 2012-2035 RTP/SCS. The Plan would have a significant impact:

- If shadow-sensitive uses would be shaded by project-related structures for more than three hours in the winter or for more than four hours during the summer.

Methodology

The following summarizes the approach used to evaluate the expected impacts of implementation of the proposed 2012-2035 RTP/SCS on aesthetics and views.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all

transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of aesthetics and views includes a comparison between the expected future conditions with the proposed Plan and the expected future conditions if no Plan were adopted. This evaluation is not included in the determination of the significance of impacts (which is based on a comparison of future conditions to existing conditions); however it provides a meaningful perspective on the effects of the 2012-2035 RTP/SCS.

Determination of Significance

The methodology for determining the significance of these impacts compares the existing setting to expected future Plan conditions, as required in Public Resources Code Section 15126.2(a). The analysis assesses expected impacts to designated scenic resources, including scenic highways or vista points that may be caused by projects proposed within the Plan and/or the anticipated associated land use pattern, and growth. The following factors were considered in assessing the significance of impacts from the proposed Plan on scenic resources:

Scale – the size, proportion, and "fit of transportation improvements and development as compared to the surrounding area; and

Degree of visibility – the extent to which transportation improvements and/or anticipated development can be seen. This depends to a large extent on route alignment and configuration (i.e., elevated, at grade, depressed, or underground) of the transportation improvement and location, height/bulk, construction materials (reflectivity, color) of development. Generally, elevated grade transportation investments have a more substantial impact on aesthetics and views, while the taller a development generally the greater the potential for impact.

Implementation of the 2012-2035 RTP/SCS would affect aesthetics and views. Expected significant impacts would be the obstruction of scenic views and resources, altering areas along State designated scenic highways and vista points, creating significant contrasts with the scale, form, line, color and overall visual character of the existing landscape, and adding visual urban elements to rural areas.

Both short-term construction related impacts and long-term or permanent impacts would occur as a result of implementation of the 2012-2035 RTP/SCS. Below are descriptions of the types of direct impacts foreseeable from new transportation projects proposed in the 2012-2035 RTP/SCS as well as impacts anticipated to result from increased population and development patterns expected to occur under the 2012-2035 RTP/SCS.

Generally, proposed RTP projects are of the following two types:

- New Systems: new facilities, goods movement roadway facilities, rail corridors, connectors, interchanges, and high speed train.
- Modifications to Existing Systems: widening bridges, HOV, HOT, grade crossings, and maintenance operations.

As described in 2.0 Project Description, almost half of all expenditure within the 2012-2035 RTP/SCS is allocated to system preservation and maintenance. Therefore, highway and arterial projects proposed in the 2012-2035 RP/SCS primarily consist of widening existing highways. However, some projects involve constructing new highway segments, including auxiliary goods movement roadway facilities and mixed flow connectors. Many projects and/or programs proposed in the Plan would not involve construction activities. These projects would include travel demand management (such as increasing ridesharing and carpooling)

and goods movement routing. However, critical gaps remain in the region's transportation system and the Plan includes highway projects that would complete these gaps. Table 2-7 in the Project Description highlights some of these system expansion and completion projects.

The 2012-2035 RTP/SCS also calls for expansion of transit facilities and service over the next 25 years. Many of the proposed public transit projects would involve service alterations on existing streets, highways, and rail lines only. Other proposed public transit projects would involve the possible construction of new rail lines. Some public transit projects may include new stations or upgrades to existing stations. Table 2-10 in the Project Description shows major transit projects included in the 2012-2035 RTP/SCS.

Impacts to scenic resources resulting from these proposed projects would depend on several factors such as the type of project proposed for the given area, scenic resources in the given area, and duration of the proposed construction activities.

In general, scenic resources potentially would be significantly impacted by RTP projects proposing new systems (i.e., new facilities, goods movement roadway facilities, rail corridors, connectors, interchanges, and HST). Construction and operation of projects proposed within the 2012-2035 RTP/SCS could affect scenic resources located in the vicinities of these new system projects. Modification projects generally would result in short-term construction impacts to scenic resources.

Development can take many different forms. In general high-rise development has more impacts than low or medium-rise. But impacts are very site specific and must be addressed on a case-by-case basis as appropriate.

The following discussion presents a first tier regional evaluation of potential impacts of 2012-2035 RTP/SCS projects on scenic resources. However, it should be noted that the potential for significant impacts and appropriate mitigation measures would need to be identified and assessed at the project level as appropriate.

IMPACTS

Impact 3.1-1: Potential to obstruct views of scenic resources or scenic vistas.

Implementation of the transportation improvements in the proposed 2012-2035 RTP/SCS could result in both short-term and long-term visual impacts by blocking views. For the purposes of this PEIR, public views (i.e., from look-outs, roadways, parks and other public places) are analyzed for visual impacts. Construction of new facilities, expansion of existing facilities, or development of previously undisturbed sites could block or impede views of scenic resources in a given area. For example, construction of highways, connectors, interchanges, goods movement roadway facilities, HST, and sound walls could block or impede views of mountains, oceans, or rivers. Similarly individual development projects would have the potential to have the same effects. Effects from development could occur from new buildings constructed in urban areas where views of a scenic resource are blocked. This could occur as a result of increased density in HQTAs or other areas where views of scenic elements such as the San Bernardino, Santa Monica or San Gabriel Mountains are present. Similarly increased development in coastal areas such as in Ventura and Orange Counties could obstruct or diminish important ocean or open space views.

Construction impacts, although short-term, could also result in view blockage by construction equipment and scaffolding, removal of landscaping, temporary route changes, temporary signage, exposed excavation activities and slope faces with contrasting soil colors, and construction staging areas. Best Management Practices (BMPs) utilized during construction to minimize the potential visual impacts would include locating construction staging areas in less visible locations (given other environmental considerations such as avoiding

sensitive habitat, etc.), fencing and/or screening staging areas, and revegetation of exposed slopes at the earliest possible opportunity. Even with these typical practices, short-term visual impacts are often unavoidable.

Development in floodplains, wetlands, wooded areas, coastal bluffs, lagoons, reservoirs, regional parks, recreational areas, agricultural lands, or in areas that include steep slopes or scenic vistas has the potential to adversely impact the region's visual resources by blocking such scenic vistas. Several projects identified in the Plan would have the potential to create a significant visual impact. Proposed projects that could create a significant visual impact include construction of roadway improvements such as grade separated facilities for rail or buses, goods movement roadway facilities, and HOV and HOT lanes and connectors. Each of these types of projects could block or impede views of surrounding scenic resources during and after construction. Moreover, the elevation and scale of some of the proposed projects could be visually intrusive to surrounding areas (depending on the degree of visibility of the transportation facility).

Highway widening projects such as the High Desert Corridor in Los Angeles and San Bernardino Counties and the SR-241 improvement in Orange County also have the potential to impact visual resources. In addition, construction of new HOV and truck lanes along I-5 and the I-710 Gap Closure, both in Los Angeles County are examples of a new highway projects that could obstruct scenic resources. The creation of aerial structures over the top of existing features, such as connectors, have a very high potential to create visual impacts to panoramic views, views of significant landscape features, or landforms.

Several proposed transit improvements, if implemented, could affect the region's visual environment. As discussed above, the proposed 2012-2035 RTP/SCS includes projects involving new transportation facilities, as well as projects that would involve modifications to existing facilities. New light rail transit projects in Los Angeles, such as the Crenshaw Light Rail and Exposition Line to Santa Monica could also obstruct views, especially if all or parts of these lines are elevated. Many of the transit projects that are proposed would be located in urban areas and could also block views of historic resources. These effects could also occur as a result of development that would occur as a result of the 2012-2035 RTP/SCS as many valued visual resources are located within urban areas.

Goods movement roadway facilities, such as truck-only lanes extending from the San Pedro Bay Ports to downtown Los Angeles along the I-710, and connecting to the I-15 in San Bernardino County via the East – West Corridor, are examples of projects that could obstruct scenic views. Adding new goods movement roadway facilities could require the acquisition of right-of-way property that could result in the loss of vegetation along these routes and changes in topography of the given area depending on the route alignment. Elevated roadway facilities could block views of the San Gabriel Mountains, San Jose Hills, Puente Hills, San Bernardino Mountains, and Jurupa Mountains, depending on the alignment chosen.

Construction of transportation facilities that involve modifications like widening or upgrading existing roadways would involve lesser changes to the visual environment. These modification projects would most likely occur within existing roadway facilities although they could require acquisition of right-of-way property. Such changes may not block or impede views of scenic resources or scenic vistas much more than at present.

The proposed 2012-2035 RTP/SCS includes modification projects in all six counties of the SCAG region. These proposed projects would consist of improvements to existing highways, HOV lanes, HOT lanes, arterials, interchanges, bridges and grade crossings, sound wall retrofitting, and improvements to transit rail and bus services. Impacts from modification projects would generally be less substantial than those created by new system projects. The improvements proposed by these modification projects would occur on existing systems, and are not assumed to be designed at a higher elevation and therefore would not be expected to block views of scenic resources. The 2012-2035 RTP/SCS also includes active transportation projects such as bike lanes, coastal trails and safe routes to school. In many cases, such projects would not only facilitate

access to scenic parts of the region, such as coastal areas, they would also add visually pleasing elements to region through landscaping and design.

However, due to the large number of transportation projects included in the Plan, it is expected that new and expanded freeway lanes, new and expanded transit projects and new and expanded goods movement projects would result in impacts to scenic resources in the region. Similarly, increased development in the region has the potential to impact scenic resources by obstructing views. Implementation of Mitigation Measures **MM-AV1** through **MM-AV3** would reduce potential impacts to scenic resources and vistas. However, even with the implementation of these mitigation measures, the impact would remain significant.

Impact 3.1-2: Potential to alter the appearance of scenic resources along or near designated scenic highways and vista points.

The Caltrans State Scenic Highway Program was created by the State Legislature in 1963 to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. The state laws governing the Scenic Highway Program are provided in the California Streets and Highways Code, Section 260.

The State Scenic Highway System includes a list of highways that have been designated by Caltrans as scenic highways or are eligible for designation as scenic highways. These highways are designated in Section 263 of the Streets and Highways Code. Scenic highway designation can offer the following benefits:

- Protection of the scenic values of an area;
- Enhancement of community identity and pride, encouraging citizen commitment to preserving community values;
- Preservation of scenic resources to enhance land values and make the area more attractive; and
- Promotion of local tourism that is consistent with the community's scenic values.

A scenic corridor is the land generally adjacent to and visible from the highway and is identified by using a motorist's line of vision. A reasonable boundary is selected when the view extends to the distant horizon. Caltrans outlines the following minimum requirements for scenic corridor protection: regulation of land use and density of development; detailed land and site planning; control of outdoor advertising; careful attention to, and control of, earthmoving and landscaping; and careful attention to design and appearance of structures and equipment.

There is the potential for adverse visual impacts related to implementation of projects along eligible and designated scenic highways. In the event that a project is proposed in one of these areas, that project would be required to comply with applicable rules and regulations governing the protection of that area as a scenic resource. As the majority of the transportation projects in the 2012-2035 RTP/SCS are minor modifications or maintenance, the majority of scenic routes would not be affected. However, SR-91 is one of the most congested freeways in the SCAG region. Caltrans has designated 4.2 miles of SR-91, from SR-55 to the eastern city limit of Anaheim, as a State Scenic Highway. The 2012-2035 RTP/SCS includes improvements along SR-91 through Riverside and Orange Counties from I-15 to SR-241. These projects could impact this Scenic Highway. The 2012-2035 RTP/SCS also includes improvements along SR-14 as part of the High Desert Corridor, connecting Palmdale and the Antelope Valley to Santa Clarita.

While there are no restrictions on scenic highway projects, local agencies and Caltrans must work together to coordinate projects and ensure the protection of the scenic value to the greatest extent possible. For example, state law requires the undergrounding of all visible electricity distribution lines within 1,000 feet of a scenic highway. In some cases, local governments have their own land use and site planning regulations to project scenic values along a given corridor.

The 2012-2035 RTP/SCS also includes land use strategies and a development pattern that aims to achieve a more compact growth distribution in the region. Much of the development that would occur would be directed to HQTAs, urbanized areas with infrastructure in place. Several HQTAs extend along scenic highways and, as such, would have the potential to impact scenic highways or vistas. Impacts would occur if development were to detract or diminish the elements that contribute to the scenic nature of the highway. For example, a modern office building or retail center located along such a highway could be incongruous with the surrounding scenic nature if not properly shielded from view.

The potential for the 2012-2035 RTP/SCS to impact rock outcroppings or other scenic elements such as historic resources also exists. As discussed above, many of the projects and the HQTAs are in areas with designated scenic resources including historic buildings and scenic rock outcroppings. Therefore, there is potential for the 2012-2035 RTP/SCS to affect these resources. Due to the location of transportation projects and anticipated development along scenic highways this would be a significant impact.

Implementation of Mitigation Measures **MM-AV4** through **MM-AV7** would reduce potential impacts to scenic resources along or near designated scenic highways and vista points. However, even with the implementation of these mitigation measures, the impact would remain significant.

Impact 3.1-3: Potential to create significant contrasts with the overall visual character of the existing landscape setting or add urban visual elements to an existing natural, rural, and open space area.

The SCAG region contains 38,000 square miles, many of which are in their natural state or are primarily rural. Transportation projects outside of the urban core would add visual elements of urban character to these regions. Some of the projects in the 2012-2035 RTP/SCS are located in rural parts of the region. New construction and modification projects would add visual elements of urban character to these rural areas. Proposed enhancements to existing facilities and construction of new highways, roadways, and other transit facilities, as well as new development or densification of residential, commercial and similar land uses could create adverse visual impacts by adding visual elements of urban character to existing rural or open spaces. This could occur where new alignments or road widening would pass through primarily rural, agricultural, and/or open space areas and the contrast could potentially result in a significant impact to visual quality (e.g., High Desert Corridor, Foothill South/SR-241).

The 2012-2035 RTP/SCS focuses the majority of new housing and job growth in HQTAs and other opportunity areas in existing main streets, downtowns, and commercial corridors. This overall land use development pattern supports and compliments the proposed transportation network that emphasizes system preservation, active transportation, and transportation demand management measures. However, the densification of uses, even in existing urbanized areas, could result in changes to the overall visual character. For example, the Gold and Crenshaw Light Rail Lines both will travel through urban neighborhoods with distinct character and may be located adjacent to historic resources depending on the final alignments. The wires, structures and other elements associated with light rail would change the character of these areas. Increased urbanization through taller buildings or more compact development could have a similar effect by changing the low-scale nature of a particular neighborhood.

In urbanized areas, roadways and ancillary improvements such as sound walls introduced by the proposed 2012-2035 RTP/SCS could also result in adverse visual impacts depending on the scale of improvements and location of sensitive viewers, including the driving public, users of gathering places, rest areas and vista points, and residents who live near resources. Highway widening and the construction of HOV and managed lanes, and park-and- ride lots may result in some loss of existing freeway landscaping. Although these activities generally occur in urbanized environments, these actions could have an adverse effect on visual quality, depending upon nearby sensitive viewers.

Arterials and freeways comprise a major component of the existing visual environment of the region. Arterials in the region offer a variety of visual experiences from the uncrowded, undeveloped stretches of

rural roads in Imperial, San Bernardino, Riverside, and Ventura counties to the narrow winding roads in the mountain areas and the high-volume urban streets in the densely populated areas of Los Angeles and Orange counties. Improvement of existing highway facilities in highly urbanized areas would result in relatively minor impacts to visual quality because of their location in urban environments.

Significant impacts could also occur if proposed alignments or facilities require large cut-and-fill slopes or noise barriers, whether in previously undeveloped areas or in already developed urban areas. Careful alignment and design, conformance with local grading ordinances, and installation of landscaping to ensure compatibility with surrounding development would be expected to reduce visual impacts to less-than-significant at the project level. Since the majority of the projects exist in areas with existing roadway networks, impacts to areas such as wetlands, coastal bluffs, and forests are generally unlikely.

As already mentioned, proposed projects in the 2012-2035 RTP/SCS include construction of roadway improvements such as grade separated facilities for rail and buses, goods movement roadway facilities, and HOV and HOT connectors, as well as construction of the HST system. Grade separated facilities could have a substantial adverse visual impact on surrounding land uses during and after construction. The elevation and scale of the proposed grade separated facilities could create a significant contrast with the overall visual character of the existing landscape setting. Modification projects that involve the widening or upgrading of existing roadways can be designed to complement the existing system, and therefore, would involve lesser changes to the visual character of the existing landscape setting.

Transit centers and park-n-ride lots would be constructed primarily within the heavily urbanized portions of the SCAG region and could consequently affect a large number of viewers. Transit centers would be expected to be dominant visual elements due to their fixed structures, including terminals, service facilities, and lighted parking lots. While these facilities would become integrated with the urban setting over time, their initial effect could result in a change in visual quality. Elevated and at-grade transit facilities such as the Crenshaw Light Rail and Gold Line Extension have the greatest potential to change the visual character of an area while underground heavy rail facilities such as the Westside Subway Extension would have fewer impacts. Nonetheless, projects within the 2012-2035 RTP/SCS would result in changes to the visual character of existing landscapes or natural areas. Implementation of Mitigation Measures **MM-AV8** through **MM-AV11** would reduce potential impacts to visual character impacts. However, even with the implementation of these mitigation measures, the impact would remain significant.

Impact 3.1-4: Potential to result in shade and shadow or light and glare impacts

Shade and shadow impacts generally occur when construction of a new element, such as a tall building, either casts a shadow on a nearby shadow sensitive use. Shadow sensitive uses are generally any usable outdoor space such as eating or playing areas. For example, construction of a new building that cast a shadow on a nearby school playground for an extended period of time would likely have a shadow impact. Most transportation projects would not be expected to have a shade or shadow impacts because most transportation infrastructure is not located near sensitive outdoor uses. Shade and shadow impacts would be expected to occur in urban areas as a result of the densification of land uses (i.e., the construction of new taller structures casts shadows on sensitive outdoor uses) or through elevated transportation infrastructure, such as elevated light rail. Both the light rail line itself and the associated stations have the potential to cast shadows on nearby uses. The 2012-2035 RTP/SCS does not include specific development projects.. However, due to the encouragement of more compact development it is anticipated that shade and shadow impacts would occur. This impact would be significant.

Similar to shade and shadow impacts, light and glare effects often occur in urban areas. Glare is typically a daytime condition where the sun reflects off a particular building, while lighting effects often occur when new nighttime sources of lighting are introduced into an area. Both of these conditions could occur as a result of the 2012-2035 RTP/SCS. As discussed above compact development anticipated under with the HQTAs could result in more occurrences of glare in urban areas. It is also anticipated that the introduction of new

roads and infrastructure, such as transit infrastructure in previously undisturbed areas would result in lighting impacts. This could also occur as a result of new development patterns anticipated under the Plan. This would be a significant impact. Implementation of Mitigation Measure **MM-AV12** would reduce potential for light and glare impacts. However, even with the implementation of this mitigation measures, the impact would remain significant.

Cumulative Impact 3.1-4: Potential to result in a cumulative loss of scenic resources.

The 2012-2035 RTP/SCS includes transportation projects and land use strategies that will shape the region over the next 23 years. These changes will include the extension of transportation and related infrastructure that would impact scenic resources. Many of these transportation projects will facilitate access not only within the region (as discussed above) but also to areas outside the region. In addition, Plan projects will connect with projects outside the region facilitating and potentially inducing construction of transportation infrastructure outside the region. This additional infrastructure outside the region could lead to development outside the region. The combination of urban infrastructure and development would change the character of the region. Some of these changes would be expected to occur on the fringe of the region. Urbanization or loss of these visual resources could also affect areas outside the region as many of these scenic areas extend beyond the SCAG region. As a result the 2012-2035 RTP/SCS could indirectly result in changes to the visual character or to scenic areas outside the SCAG region. Therefore, the 2012-2035 RTP/SCS would contribute to a cumulatively considerable loss of scenic resources. Implementation of Mitigation Measures **MM-AV1** through **MM-AV12** would reduce potential impacts to scenic resources along or near designated scenic highways and vista points. However, even with the implementation of these mitigation measures, the impact would remain significant.

MITIGATION MEASURES

Scenic Vistas

MM-AV1: Prior to the issuance of permits, project sponsors can and should require and projects should, to the extent feasible, construct noise barriers of materials whose color and texture complements the surrounding landscape and development. Noise barriers should be graffiti resistant and landscaped with plants that screen the barrier, preferably with either native vegetation or landscaping that complements the dominant landscaping of surrounding areas. Natural landscaping should be used to minimize contrasts between the project and surrounding areas. Wherever possible, interchanges and transit lines at the grade of the surrounding land should limit view blockage.

MM-AV2: Project sponsors can and should use natural landscaping to minimize contrasts between the project and surrounding areas. Wherever possible, structures should be designed to limit view blockage. Edges of major cut-and-fill slopes should be contoured to provide a more natural looking finished profile. Project sponsors should replace and renew landscaping along corridors with road widenings, interchange projects, and related improvements. New corridor landscaping should be designed to respect existing natural and man-made features and to complement the dominant landscaping of surrounding areas.

MM-AV3: Prior to project approval, project sponsors can and should implement design guidelines, local policies, and programs aimed at protecting views of scenic corridors and avoiding visual intrusions. Projects should be designed to minimize contrasts in scale and massing between the project and surrounding natural forms and developments. Avoid, if possible, large cuts and fills when the visual environment (natural or urban) would be substantially disrupted. Site or design of projects should minimize their intrusion into important viewsheds and use contour grading to better match surrounding terrain.

Scenic Highways

MM-AV4: Project sponsors can and should construct sound walls of materials whose color and texture complements the surrounding landscape and development and use color, texture, and alternating facades to "break up" large facades and provide visual interest. Where there is room, project sponsors should landscape the sound walls with plants that screen the sound wall, preferably with either native vegetation or landscaping that complement the dominant landscaping of surrounding areas.

MM-AV5: SCAG shall coordinate with Caltrans and local agencies as part of SCAG's outreach and technical assistance to local governments under Compass Blueprint and Toolbox Tuesdays, to advocate that projects avoid locally designated scenic highways and/or vista points. Project sponsors can and should avoid construction of transportation facilities in state and locally designated scenic highways and/or vista points. When avoidance is not possible, project sponsors should minimize visual quality intrusions to the maximum extent feasible.

MM-AV6: For projects in designated or eligible Scenic Highway corridors, prior to project approval, project sponsors can and should complete design studies and develop site-specific mitigation measures to minimize impacts on the quality of the views or visual experience that originally qualified the highway for scenic designation.

MM-AV7: SCAG shall coordinate with Caltrans and local agencies as part of SCAG's outreach and technical assistance to local governments under Compass Blueprint and Toolbox Tuesdays, to advocate that projects to be consistent with applicable guidelines and regulations for the preservation of scenic resources along scenic highways. If projects are constructed in state- and locally-designated scenic highways and/or vista points, design, construction, and operation of the transportation facility can and should be consistent with applicable guidelines and regulations for the preservation of scenic resources along the designated scenic highway.

Visual Character

MM-AV8: Project sponsors can and should design projects to minimize contrasts in scale and massing between the project and surrounding natural forms and development. Project sponsors should design projects to minimize their intrusion into important viewsheds and use contour grading to better match surrounding terrain. To the maximum extent feasible, landscaping along highway corridors should be designed to add significant natural elements and visual interest to soften the hard-edged, linear travel experience that would otherwise occur.

MM-AV9: Project sponsors can and should develop design guidelines projects that make elements of proposed buildings/facilities visually compatible with surrounding areas. Visual design guidelines should, at a minimum, include setback buffers, landscaping, color, texture, signage, and lighting criteria. The following methods should be employed whenever possible:

- Transportation systems should be developed to be compatible with the surrounding environment (i.e., colors and materials of construction material).
- Vegetation used as screening and landscaping should blend in and complement the natural landscape.
- Trees bordering highways should remain or be replaced so that clear-cutting is not evident.
- Grading should blend with the adjacent landforms and topography.

MM-AV10: In visually sensitive areas and prior to project approval, local land use agencies can and should apply development standards and guidelines to maintain compatibility with surrounding natural areas, including site coverage, building height and massing, building materials and color, landscaping, site grading, etc.

MM-AV11: Project sponsors can and should ensure that sites should be kept in a blight/nuisance-free condition. Any existing blight or nuisance should be abated within 60-90 days of approval, unless an earlier date is specified elsewhere.

Shade and Shadow/Light and Glare

MM-AV12: Project sponsors can and should ensure that proposed lighting fixtures are adequately shielded to a point below the light bulb and reflector and that prevent unnecessary glare onto adjacent properties. Plans should be submitted to the Lead Agency (or other government agency as appropriate) for review and approval. All lighting should be architecturally integrated into the site.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Scenic Vistas

Implementation of Mitigation Measures **MM-AV1** through **MM-AV3** would reduce impacts to scenic vistas; however, it is likely there will be situations where visual impacts cannot be mitigated to a less than significant. Therefore, impacts to scenic vistas would remain significant after mitigation.

Scenic Highways

Implementation of Mitigation Measures **MM-AV4** through **MM-AV7** would reduce potential impacts to scenic resources along or near designated scenic highways and vista points. However, even with the implementation of these mitigation measures, the impact would remain significant.

Visual Character

Implementation of Mitigation Measures **MM-AV8** through **MM-AV11** would reduce the effects of introducing urban elements to rural areas; however, the impacts would remain significant.

Light and Glare

Implementation of Mitigation Measure **MM-AV12** would reduce the potential light and glare impacts, however, the impact would remain significant.

Cumulative Effects

Implementation of Mitigation Measures **MM-AV1** through **MM-AV12** would reduce cumulative impacts: however, as the Plan could result in changes to scenic resources or visual character in areas outside the region, this impact will remain significant.

COMPARISION WITH THE NO PROJECT ALTERNATIVE

In the No Project Alternative, the population of the SCAG region would still grow by close to 4 million people, however no regional transportation investments would be made above the existing programmed projects. The population distribution would follow past trends, uninfluenced by the Plan's emphasis on HQTAs.

Direct Impacts

Since the No Project Alternative includes fewer transportation projects than the Plan, it would have a lesser impact in terms of obstructing views and scenic resources, creating contrasting visual elements and adding visual elements to existing natural, rural, and open space areas. The No Project Alternative would not affect any State Scenic Highways or vista points.

The No Project Alternative is expected to accommodate the same increase in total population, households and jobs as the Plan. However, the Plan includes strategies to focus growth in HQTAs which would help reduce the consumption and disturbance of natural lands and reduce impacts to aesthetics and views. Under the No Project Alternative, these land use strategies may not occur – although individual jurisdictions may still seek to reduce the urban footprint through their general plans. The Plan also includes transportation improvements that facilitate access to undeveloped lands, making those lands more attractive for development than under the No Project Alternative. However, the Plan includes policies to dissuade such encroachment on open space and vacant lands and is anticipated to result in far fewer impacts. Specifically, the 2012-2035 RTP/SCS contains a Natural Lands Acquisition and Open Space Conservation Strategy to address this issue. It is anticipated that the land use planning strategies included in the 2012-2035 RTP/SCS will minimize consumption of vacant, open space/recreation and agricultural lands compared to the No Project Alternative (about 213,000 acres under the Plan and about 474,900 acres under the No Project Alternative). **The No Project impacts would be greater than the Plan impacts for Impacts 3.1-1, 3.1-2, 3.1-3, and 3.1-4 because of the increased consumption of open space and vacant land.**

Cumulative Effects Outside the Region

The 2012-2035 would result in cumulative effects outside the region as it would introduce urban elements into non urban areas and change the visual character of the region. This change would not be confined to the region as many of the areas that would be developed or could change are liked to areas outside the county. Under the No Project Alternative this condition would also occur and would be expected to be worsened. The No Project Alternative includes a less compact development and would result in more development in non urban areas further facilitating growth and visual changes outside the region. Therefore, the No Project would result in greater cumulative impacts than the Plan.

3.2 AIR QUALITY

This section describes current air quality in the SCAG region, discusses the potential impacts of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategies (2012-2035 RTP/SCS or Plan) on air quality, identifies mitigation measures for the impacts, and evaluates the residual impacts.

This analysis focuses on air pollution from on-road motor vehicles in two perspectives: daily emissions and pollutant concentrations. "Emissions" refer to the quantity of pollutants released into the air, measured in pounds per day (ppd). "Concentrations" refer to the amount of pollutant material per volumetric unit of air, measured in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The following discussion identifies the pollutants included in this analysis.

Pollutants and Effects

Health-based air quality standards have been established by California and the federal government for the following criteria pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO2), particulate matter 2.5 microns or less in diameter (PM2.5), particulate matter ten microns or less in diameter (PM10), and lead (Pb). California also includes standards for Hydrogen Sulfide, Vinyl Chloride, sulfate and visibility.

The following summarizes the health effects of the criteria pollutants:[1]

Carbon Monoxide (CO). CO is a colorless, odorless, relatively inert gas. It is a trace constituent in the unpolluted troposphere, and is produced by both natural processes and human activities. In remote areas far from human habitation, CO occurs in the atmosphere at an average background concentration of 0.04 ppm, primarily as a result of natural processes such as forest fires and the oxidation of methane. Global atmospheric mixing of CO from urban and industrial sources creates higher background concentrations (up to 0.20 ppm) near urban areas. The major source of CO in urban areas is incomplete combustion of carbon-containing fuels, mainly gasoline. Consequently, CO concentrations are generally highest in the immediate vicinity of major concentrations of vehicular traffic but it disperses rapidly beyond 500 feet of the vicinity.

CO is a primary pollutant, meaning that it is directly emitted into the air, not formed in the atmosphere by chemical reaction of precursors, as is the case with ozone and other secondary pollutants. Ambient concentrations of CO in the region exhibit large spatial and temporal variations due to variations in the rate at which CO is emitted and in the meteorological conditions that govern transport and dilution. Unlike O_3, CO tends to reach high concentrations in the fall and winter months. The highest concentrations frequently occur on weekdays at times consistent with rush hour traffic and late night during the coolest, most stable portion of the day.

Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of worsening oxygen supply to the heart.

Inhaled CO has no direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport by competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, health conditions requiring an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include patients with diseases involving heart and blood vessels, fetuses (unborn babies), and patients with chronic hypoxemia (oxygen deficiency) as seen in high altitudes.

[1]SCAQMD, *Final EIR for the 2007 Air Quality Management Plan*, June 2007.

Reductions in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO resulting in COHb levels similar to those observed in smokers. Recent studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels. These include pre-term births and heart abnormalities.[2]

Volatile Organic Compounds (VOCs). VOCs are typically formed from combustion of fuels and/or released through evaporation of organic liquids. Some VOCs are also classified by the State as toxic air contaminants. While there are no specific VOC ambient air quality standards, VOC is a prime component (along with NOx) of the photochemical processes by which such criteria pollutants as ozone, nitrogen dioxide, and certain fine particles are formed. These criteria pollutants are thus regulated as "precursors" to formation of ozone.

Ozone (O_3). O_3, a colorless gas with a sharp odor, is a highly reactive form of oxygen. High O_3 concentrations exist naturally in the stratosphere. Some mixing of stratospheric O_3 downward through the troposphere to the earth's surface does occur; however, the extent of O_3 transport is limited. At the earth's surface in sites remote from urban areas, O_3 concentrations are normally very low (0.03-0.05 ppm). For comparison, one- and eight-hour O_3 concentrations in the SCAG region typically range between 0.1 and 0.15 ppm.

While O_3 is beneficial in the stratosphere because it filters out skin-cancer-causing ultraviolet radiation, it is a highly reactive oxidant. It is this reactivity which accounts for its damaging effects on materials, plants, and human health at the earth's surface.

The propensity of O_3 for reacting with organic materials causes it to be damaging to living cells, and ambient O_3 concentrations in the South Coast Air Basin (SCAB) are frequently sufficient to cause health effects. O_3 enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, and reduces the respiratory system's ability to remove inhaled particles and fight infection.

Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible subgroups for O_3 effects. Short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient O_3 levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in high O_3 communities. Elevated O_3 levels are also associated with increased school absences.

O_3 exposure under exercising conditions is known to increase the severity of the above-mentioned observed responses. Animal studies suggest that exposures to a combination of pollutants which include O_3 may be more toxic than exposure to O_3 alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.

Nitrogen Dioxide (NO_2). NO_2 is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N_2) and oxygen (O_2) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO_2. NO_2 is responsible for the brownish tinge of polluted air. The two gases, NO and NO_2, are referred to collectively as NO_X. In the presence of sunlight, NO_2 reacts to form nitric oxide and an oxygen atom. The oxygen atom can react further to form ozone, via a complex series of chemical reactions involving hydrocarbons. Nitrogen dioxide may also react to form nitric acid (HNO_3) which reacts further to form nitrates, components of PM2.5 and PM10.

[2]SCAQMD, *Final EIR for the 2007 Air Quality Management Plan*, June 2007.

Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposures to NO_2 at levels found in homes with gas stoves, which are higher than ambient levels found in Southern California. Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO_2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma and/or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups. More recent studies have found associations between NO_2 exposures and cardiopulmonary mortality, decreased lung function, respiratory symptoms and emergency room asthma visits.

In animals, exposure to levels of NO_2 considerably higher than ambient concentrations results in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of ozone exposure increases when animals are exposed to a combination of O_3 and NO_2.

Sulfur Dioxide (SO_2). SO_2 is a colorless gas with a sharp rotten egg odor. It reacts in the air to form sulfuric acid (H_2SO_4), which contributes to acid precipitation, and sulfates, which are components of PM10 and PM2.5. Most of the SO_2 emitted into the atmosphere is produced by burning sulfur-containing fuels.

Exposure of a few minutes to low levels of SO_2 can result in airway constriction in some asthmatics. All asthmatics are sensitive to the effects of SO_2. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, is observed after acute higher exposure to SO_2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO_2.

Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO_2 levels. In these studies, efforts to separate the effects of SO_2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.

Particulate Matter. Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (PM10, or particulate matter less than about 10 micrometers in diameter) and fine particles (PM2.5, or particulate matter less than 2.5 micrometers in diameter) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis and other lung diseases. Children, elderly, exercising adults, and those suffering from asthma, pre-existing respiratory and/or cardiovascular disease are especially vulnerable to adverse health effects of PM10 and PM2.5.

A consistent correlation between elevated ambient particulate matter (PM10 and PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by fine particles (PM2.5) and increased mortality (especially from lung cancer) and reduction in life-span.

Daily fluctuations in PM2.5 concentration levels have also been related to hospital admissions for acute respiratory conditions, to school and kindergarten absences, to a decrease in respiratory function in normal children and to increased medication use in children and adults with asthma. Studies have also shown lung function growth in children is reduced with long-term exposure to PM10 and PM2.5.[3]

Sulfates. Sulfates are chemical compounds that contain the sulfate ion (SO_4), and are part of the mixture of solid materials that make up PM_{10}. Most of the sulfates in the atmosphere are produced by oxidation of sulfur dioxide. Oxidation of sulfur dioxide yields sulfur trioxide (SO_3) that reacts with water to form sulfuric

[3]SCAQMD, *Final EIR for the 2007 Air Quality Management Plan*, June 2007.

acid, which contributes to acid deposition. The reaction of sulfuric acid with basic substances such as ammonia yields sulfates, a component of PM10 and PM2.5.

Most of the health effects associated with PM2.5 and sulfur dioxide at ambient levels are also associated with sulfates. Thus, both mortality and morbidity effects have been observed with an increase in ambient sulfate concentrations. However, efforts to separate the effects of sulfates from the effects of other pollutants have generally not been successful.

Clinical studies of asthmatics exposed to sulfuric acid suggest that adolescent asthmatics are possibly a subgroup susceptible to acid aerosol exposure. Animal studies suggest that acidic particles such as sulfuric acid aerosol and ammonium bisulfate are more toxic than non-acidic particles like ammonium sulfate. Whether the effects are attributable to acidity or to PM10/PM2.5 remains unresolved.

Lead (Pb). Pb in the atmosphere is present as a mixture of a number of Pb compounds. Leaded gasoline and Pb smelters have been the main sources of Pb emitted into the air. Due to the phasing out of leaded gasoline, there was a dramatic reduction in atmospheric Pb in the SCAB over the past two decades.

Fetuses, infants, and children are more sensitive than others to the adverse effects of Pb exposure. Exposure to low levels of Pb can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased Pb levels are associated with increased blood pressure.

Pb poisoning can cause anemia, lethargy, seizures, and death. It appears that there are no direct effects of lead on the respiratory system. Pb can be stored in the bone from early-age environmental exposure, and elevated blood lead levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland), and osteoporosis (breakdown of bony tissue). Fetuses and breast-fed babies can be exposed to higher levels of Pb because of previous environmental Pb exposure of their mothers.

Toxic Air Contaminants (TACs). TACs, also referred to as hazardous air pollutants (HAPs), are generally defined as those contaminants that are known or suspected to cause serious health problems, but do not have a corresponding ambient air quality standard. TACs are also defined as an air pollutant that may increase a person's risk of developing cancer and/or other serious health effects; however, the emission of a toxic chemical does not automatically create a health hazard. Other factors, such as the amount of the chemical; its toxicity, and how it is released into the air, the weather, and the terrain, all influence whether the emission could be hazardous to human health. TACs are emitted by a variety of industrial processes such as petroleum refining, electric utility and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust and may exist as PM10 and PM2.5 or as vapors (gases). TACs include metals, other particles, gases absorbed by particles, and certain vapors from fuels and other sources.

The emission of toxic substances into the air can be damaging to human health and to the environment. Human exposure to these pollutants at sufficient concentrations and durations can result in cancer, poisoning, and rapid onset of sickness, such as nausea or difficulty in breathing. Other less measurable effects include immunological, neurological, reproductive, developmental, and respiratory problems. Pollutants deposited onto soil or into lakes and streams affect ecological systems and eventually human health through consumption of contaminated food. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of contracting cancer.

The public's exposure to TACs is a significant public health issue in California. The Air Toxics "Hotspots" Information and Assessment Act is a state law requiring facilities to report emissions of TACs to air districts. The program is designated to quantify the amounts of potentially hazardous air pollutants released, the location of the release, the concentrations to which the public is exposed, and the resulting health risks.

The State Air Toxics Program (AB 2588) identified over 200 TACs, including the 188 TACs identified in the federal Clean Air Act. The Unites States Environmental Protection Agency (USEPA) has assessed this expansive list of toxics and identified 21 TACs as Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and nonroad equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. USEPA also extracted a subset of these 21 MSAT compounds that it now labels as the six priority MSATs: benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene. While these six MSATs are considered the priority transportation toxics, USEPA stresses that the lists are subject to change and may be adjusted in future rules.[4]

The California-specific transportation air quality analysis model, EMFAC, is designed to model MSATs at the project-level. Health effects from MSATs/TACs, i.e., cancer risks and chronic non-cancer risks from on-road traffic, have been associated primarily with diesel PM, benzene, and 1,3-butadiene. EMFAC can be used to estimate diesel particulate matter, benzene, and 1,3-butadiene emissions. In addition to diesel particulate matter (diesel PM), benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, paradichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient TAC risk, for which data are available, in California.

MSATs/TACs may threaten public health even at low concentrations due to their high toxicity. Therefore, no exposure levels are considered safe for TACs/MSATs. For federal highway projects, FHWA has established the following interim policy for the impact analysis of TACs and MSATs: "Given the emerging state of the science and of project-level analysis techniques, there are no established criteria for determining when MSAT emissions should be considered a significant issue in the NEPA context."

The California Office of Environmental Health Hazard Assessment (OEHHA) has established protocols and methods for performing health risk analyses (HRAs) for stationary sources and some area sources; however, highway sources are mobile sources.

To date, the most comprehensive study of air toxics in the SCAB is the Multiple Air Toxics Exposure Study (MATES-III), conducted by Southern California Air Quality Management District (SCAQMD). The monitoring program measured more than 30 air pollutants, including both gases and particulates. The monitoring study was accompanied by a computer modeling study in which SCAQMD estimated the risk of cancer from breathing toxic air pollution throughout the region based on emissions and weather data. MATES-III found that the cancer risk in the region from carcinogenic air pollutants ranges from about 870 in a million to 1,400 in a million, with an average regional risk of about 1,200 in a million.

Air Dispersion. TACs/MSATs impact those located closest to the emission sources more than those located further away. A California law passed in 2003 (Public Resources Code Section 21151.8) prohibits the siting of a school within 500 feet of a freeway unless, "the school district determines, through analysis based on appropriate air dispersion modeling, that the air quality at the proposed site is such that neither short-term nor long-term exposure poses significant health risks to pupils."

USEPA has issued a number of regulations that will dramatically decrease MSATs through cleaner fuels and cleaner engines. According to an FHWA analysis, even if the number of vehicle miles traveled (VMT) increases by 64 percent, reductions of 57 percent to 87 percent in MSATs are projected from 2000 to 2020. These are national figures, and data for California, the SCAG region, and individual roadways may vary.

[4]FHWA, *Memorandum. Information: Interim Guidance on Air Toxic Analysis in NEPA Documents*, September 30, 2009.

Diesel Particulate Matter (diesel PM). According to the 2006 California Almanac of Emissions and Air Quality, the majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from the exhaust of diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances.

Diesel exhaust is composed of two phases, gas and particle, and both phases contribute to the health 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. The particle phase is also composed of many different types of particles by size or composition. Fine and ultra fine diesel particulates are of the greatest health concern, and may be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals and other trace elements. Diesel exhaust is emitted from a broad range of diesel engines; the on road diesel engines of trucks, buses and cars and the off road diesel engines that include locomotives, marine vessels and heavy duty equipment. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

The most common exposure to diesel PM is breathing the air that contains diesel PM. The fine and ultra-fine particles are respirable (similar to PM2.5), which means that they can avoid many of the human respiratory system defense mechanisms and enter deeply into the lung. Exposure to diesel PM comes from both on-road and off-road engine exhaust that is either directly emitted from the engines or lingering in the atmosphere.

Diesel exhaust causes health effects from both short-term or acute exposures, and long-term chronic exposures. The type and severity of health effects depends upon several factors including the amount of chemical exposure and the duration of exposure. Individuals also react differently to different levels of exposure. There is limited information on exposure to just diesel PM but there is enough evidence to indicate that inhalation exposure to diesel exhaust causes acute and chronic health effects.

Acute exposure to diesel exhaust may cause irritation to the eyes, nose, throat and lungs, some neurological effects such as lightheadedness. Acute exposure may also elicit a cough or nausea as well as exacerbate asthma. Chronic exposure to diesel PM in experimental animal inhalation studies have shown a range of dose-dependent lung inflammation and cellular changes in the lung and 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.[5]

USEPA's National Scale Assessment uses several types of health hazard information to provide a quantitative "threshold of concern" or a health benchmark concentration at which it is expected that no adverse health effects occur at exposures to that level. Health effects information on carcinogenic, short- and long-term non-carcinogenic end points are used to establish selective protective health levels to compare to the modeled exposures levels. Unfortunately the exposure response data in human studies are considered too uncertain to develop a carcinogenic unit risk for USEPA's use. There is a Reference Concentration (RFC) that is used as a health benchmark protective of chronic non-carcinogenic health effects but it is for diesel exhaust and not specifically set for diesel PM. The RFC for diesel exhaust, which includes diesel PM, is 5 $\mu g/m^3$.[6] This value is similar to the National Ambient Air Quality Standard established for fine particulate matter (PM2.5), which is 15 $\mu g/m^3$.

[5]USEPA, Diesel Particulate Matter. Available at *http://www.epa.gov/region1/eco/airtox/diesel.html*.
[6]*Ibid.*

Unlike other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, California Air Resources Board (ARB) has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM10 database, ambient PM10 monitoring data, and the results from several studies to estimate concentrations of diesel PM.

Diesel PM poses the greatest health risk among these ten TACs mentioned. Based on receptor modeling techniques, SCAQMD estimated that diesel PM accounts for 84 percent of the total risk in the SCAB.[7]

Recent studies of the potential effect of roadway emissions on air quality sensitive receptors. Vehicle emissions contain a number of substances that can be harmful, including TACs such as benzene and diesel PM. A growing body of scientific evidence shows that living or going to school near roadways with heavy traffic volumes is associated with a number of adverse effects. These include increased respiratory symptoms, increased risk of heart and lung disease, and elevated mortality rates.[8]

While most of the initial studies were conducted in Europe, a number of research projects conducted in the United States and California are finding similar results. For example, as of 2005, the Children's Health Study, a ten-year study conducted by the University of Southern California School of Medicine, found strong evidence that exposure to pollutants related to vehicle emissions such as $NO_2$and elemental carbon (or soot) is linked to a slowing of lung function growth. The researchers concluded that the resulting deficits in lung function are likely permanent and may increase the risk for respiratory and other diseases later in life. The study also found that the children in the study who lived nearest to roadways with heavy traffic, such as freeways, showed increased risk for having asthma.[9]

The East Bay Children's Respiratory Health Study. The East Bay Children's Respiratory Health Study, conducted in 2001, included more than 1,100 students between the 3rd and 5th grades.[10] The study included ten neighborhoods with school sites located upwind and downwind from major roads. The San Francisco ay area has strong prevailing winds, and this study found that downwind direction and proximity to major roads was an important determinant of increased exposure to traffic pollutants. This study found higher concentrations of black carbon, oxides of nitrogen, and nitrogen oxide at schools located downwind from freeways as compared with those schools upwind or farther from major traffic sources.

For children residing at their current address for at least one year, investigators found a modest but significant increase of five to eight percent in bronchitis and asthma symptoms in children in neighborhoods with higher concentrations of traffic pollutants.

California Office of Environmental Health Hazard Assessment (OEHHA) School Study. The OEHHA studied public schools in California, various socioeconomic factors, and their proximity to major roads. The study found that about two percent of all the public schools in California, incorporating about 150,000 students, are within 150 meters (500 feet) of a very busy roadway. The study also provided recommendations on ways to mitigate exposure of students to traffic-related pollutants in the event that a school is located near busy roadways. The related fact sheet includes the following:

- Where are people exposed to air pollution from nearby traffic?

  Motor vehicles are part of our everyday lives. We breathe air with higher levels of traffic pollutants while:
  - Driving in heavy traffic, such as on main city streets and on busy highways/freeways.
  - Standing near idling cars, trucks, or buses.

[7]SCAQMD, *Multiple Air Toxics Exposure Study in the South Coast Air Basin*, September 2008.
[8]SCAQMD, *Traffic Pollutants and Health Effects*. May 20, 2005.
[9]*Ibid*.
[10]ARB, *The East Bay Children's Health Study; Traffic-Related Air Pollution Near Busy Roads*, June 7, 2004.

- Spending time at places near roads that have heavy traffic, whether it is at home, school, work, or play. Studies have found that places within 150 meters (500 feet) of main city streets, highways, and freeways generally have higher traffic pollutant levels, especially if the location is "downwind" of the road. ("Downwind" means that the wind generally blows from the road toward your location.)

- If a school is near a street with very heavy traffic, does it mean that children are exposed to high levels of traffic-related air pollution?

  Not necessarily. The prevailing wind direction strongly affects exposure to air pollution from nearby traffic. Locations that are both near and "downwind" of a freeway tend to have higher levels of traffic pollution compared with locations that tend to be "upwind" of a freeway. ("Downwind" means that the wind generally blows from the road toward your location. "Upwind" means that the wind generally blows away from your location, toward the road.)

Air Quality and Land Use Handbook. The studies described in the above paragraphs, along with other similar studies, were considered by the ARB in the preparation of the publication, Air Quality and Land Use Handbook: A Community Health Perspective.[11] In the discussion of traffic emissions and health effects, the key health findings included the following:

- Reduced lung function in children was associated with traffic density, especially trucks, within 1,000 feet and the association was strongest within 300 feet;
- Increased asthma hospitalizations were associated with living within 650 feet of heavy traffic and heavy truck volume;
- Asthma symptoms increased with proximity to roadways and the risk was greatest within 300 feet;
- Asthma and bronchitis symptoms in children were associated with proximity to high levels of traffic in a San Francisco Bay Area community with good overall regional air quality; and
- A San Diego study found increased medical visits in children living within 550 feet of heavy traffic.

The ARB concludes their analysis with the following recommendation: Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.

Childhood Asthma. A study published in 2006 examined the relationship of residence near a freeway and susceptibility to childhood asthma.[12] This study found residence within 75 meters (245 feet) of a major road was associated with an increased risk of lifetime asthma, prevalent asthma, and wheeze. The higher risk of asthma near a major road decreased to background rates at 150 to 200 meters (490 to 655 feet) from the road. In children with a parental history of asthma and in children moving to the residence after two years of age, there was no increased risk associated with exposure. A similar pattern of effects was observed with traffic-modeled exposure. These results indicate that residence near a major road is associated with asthma.

Traffic and Lung Development. One of the most recent studies was published in February 2007, Effect of Exposure to Traffic on Lung Development from 10 to 18 Years of Age: A Cohort.[13] This study examined the pulmonary function of more than 3,500 children over a period of eight years. The studies were conducted in 12 California communities. Health effects related to distance from freeways were divided into three groups: less than 500 meters (1,640 feet) from the freeway, 500 to 1,500 meters (1,640 to 4,920 feet) from the freeway, and greater than 1,500 meters (4,920 feet) from the freeway.

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[11] ARB, *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005.

[12] McConnell, R., K. Berhane, L. Yao, M. Jerrett, F. Lurmann, F. Gilliland, N. Kunzli, J. Gauderman, E. Avol, D. Thomas, and J. Peters, *Traffic, Susceptibility, and Childhood Asthma*, 2006.

[13] Gauderman, W. J., H. Vora, R. McConnell, K. Berhane, F. Gilliland, D. Thomas, F. Lurmann, E. Avol, N. Kunzli, M. Jerrett, and J. Peters, *Effect of Exposure to Traffic on Lung Development from 10 to 18 Years of Age: A Cohort Study*, The Lancet, Volume 369. February 17, 2007.

The study shows that the residential proximity to freeway traffic is associated with substantial deficits in lung-function development in children. The effects were greater for those children who lived within 500 meters (1,640 feet) of a freeway than for those who lived at least 1,500 meters (4,920 feet) from a freeway. Since lung development is nearly complete by age 18 years, an individual with a deficit at this time will probably continue to have less than healthy lung function for the remainder of his or her life. The study did not find any evidence that traffic effects varied depending on background air quality, which suggests that even in an area with low regional pollution, children living near a major roadway are at increased risk of health effects. The results also suggest that children who live close to a freeway in a high pollution area experience a combination of adverse developmental effects because of both local and regional pollution.

Particulates at a Sacramento School Site. A multi-year study in the Sacramento area, described in a 2006 report, analyzed atmospheric particulate matter at a school site downwind of a busy secondary road.[14] The study was not a health effects study. The study is of interest for the following reasons: (1) The study indicates that exhaust from automobiles may be a greater source of toxic pollutants than diesel exhaust, and (2) a barrier of dense vegetation can be one element in a pollutant mitigation strategy.

The study also emphasizes that the most important mitigation for exposure near roadways is the distance from the road to the receptor. Many of the health studies described above are related to residential exposure, with a few studies occurring all or partially at schools; none were at parks. The school studies are considered most relevant to the Hall Property Community Park analysis because they involve children who would be involved in very active play at schools, similar to many activities at the proposed park, and because exposure time at schools is less than full-time residency, although still more than would be anticipated at the park. The East Bay Children's Respiratory Health Study is of particular interest because it is one of the few studies reporting health effects correlated with upwind or downwind location.

REGULATORY FRAMEWORK

Air quality is regulated at the federal, State, and regional levels. The following summarizes relevant air quality regulations and regulatory agencies.

Federal

United States Environmental Protection Agency (USEPA). The Federal Clean Air Act (CAA) governs air quality in the United States. USEPA is responsible for enforcing the CAA and for establishing the National Ambient Air Quality Standards (NAAQS). NAAQS are required under the 1977 CAA and subsequent amendments. USEPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. USEPA has jurisdiction over emission sources outside state waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet stricter emission standards established by the California Air Resources Board (ARB).

As required by the CAA, NAAQS have been established for seven major air pollutants: CO, NO_2, O_3, PM2.5, PM10, SO_2, and Pb. The CAA requires USEPA to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS have been achieved. The federal and state standards are summarized in **Table 3.2-1**.

[14]Cahill, T. A., *Vehicular Exposures and Potential Mitigations Downwind of Watt Avenue, Sacramento, CA. Report to The Health Effects Task Force, Breathe California of Sacramento-Emigrant Trails*, 2006.

TABLE 3.2-1: STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	California /a/	Federal /b/	
		Concentration /c/	Primary /c,d/	Secondary /c,e/
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m^3)	--	Same as Primary Standard
	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	
Respirable Particulate Matter (PM10)	24-hour	50 µg/m^3	150 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m^3	--	
Fine Particulate Matter (PM2.5)	24-hour	--	35 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m^3	15.0 µg/m^3	
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	None
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	53 ppb (100 µg/m^3)	Same as Primary Standard
	1-hour	0.18 ppm (338 µg/m^3)	100 ppb (190 µg/m^3) /f/	None
Sulfur Dioxide (SO_2)	24-hour	0.04 ppm (105 µg/m^3)	--	--
	3-hour	--	--	0.5 ppm (1300 µg/m^3) /g/
	1-hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	--
Lead (Pb) /h/	30-day average	1.5 µg/m^3	--	--
	Calendar Quarter	--	1.5 µg/m^3	Same as Primary Standard
	Rolling 3-Month Average /i/	--	0.15 µg/m^3	

TABLE 3.2-1: STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	California /a/	Federal /b/	
		Concentration /c/	Primary /c,d/	Secondary /c,e/
Visibility Reducing Particles	8-hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.	No Federal Standards	
Sulfates	24-hour	25 µg/m^3		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)		
Vinyl Chloride	24-hour	0.03 ppm (42 µg/m^3)		

/a/ California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

/b/ National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact USEPA for further clarification and current federal policies.

/c/ Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas

/d/ National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

/e/ National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

/f/ Reference method as described by the USEPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the USEPA.

/g/ On June 2, 2010, the U.S. EPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. USEPA also proposed a new automated Federal Reference Method (FRM) using ultraviolet technology, but will retain the older pararosaniline methods until the new FRM have adequately permeated State monitoring networks. The USEPA also revoked both the existing 24-hour SO_2 standard of 0.14 ppm and the annual primary SO_2 standard of 0.030 ppm, effective August 23, 2010. The secondary SO_2 standard was not revised at that time; however, the secondary standard is undergoing a separate review by USEPA. Note that the new standard is in units of parts per billion (ppb). California standards are in units of ppm. To directly compare the new primary national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

/h/ The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

/i/ National lead standard, rolling 3-month average: final rule signed October 15, 2008.

SOURCE: ARB, *Ambient Air Quality Standards*, and *Attainment Status*, September 8, 2010.

Most of the SCAG region is classified as non-attainment for some criteria pollutants. The boundaries of the SCAG region federal non-attainment/maintenance areas are:

- Ventura County Portion of the South Central Coast Air Basin (SCCAB) - The entire county is a non-attainment area for 8-hour ozone.
- South Coast Air Basin (SCAB) - The entire basin is a non-attainment area for PM10, PM2.5 and 8-hour ozone and a maintenance area for CO and NO_2.
- Antelope Valley and Victor Valley portion of Mojave Desert Air Basin (MDAB) - Non-attainment areas for 8-hour ozone.
- San Bernardino County Portion of MDAB – Part of the basin is a non-attainment area for 8-hour ozone, PM10, and PM2.5.
- The Riverside County Portion of Salton Sea Air Basin (SSAB) - The entire Riverside County portion of SSAB (Coachella Valley) is a non-attainment area for PM_{10} and 8-hour ozone.

- Portions of Imperial County within SSAB – Portions of Imperial County within SSAB are designated as non-attainment for PM10, and PM2.5. The entire portion is maintenance for 8-hour ozone.

The 1970 Amendments to the CAA included a provision to address air toxics. Under Title III of the CAA, USEPA establishes and enforces National Emissions Standards for Hazardous Air Pollutants (NESHAPs), which are nationally uniform standards oriented towards controlling particular hazardous air pollutants (HAPs). Title I, Section 112(c) of the CAA further directed USEPA to develop a list of sources that emit any of 189 HAPs, and to develop regulations for these categories of sources. To date, USEPA has listed 174 categories and developed a schedule for the establishment of emission standards.[15] Rather than promulgating NESHAPs for each pollutant, the CAA directs USEPA to set source category, technology based, standards requiring companies to sharply reduce emissions of toxic air contaminants. These standards require industries to install Maximum Achievable Control Technology (MACT), which is defined as the control technology achieving the maximum degree of reduction in the emission of HAPs, taking into account cost and other factors. USEPA is required to establish and phase in specific performance based standards for all of the industries that emit one or more of the pollutants in significant quantities

State Implementation Plans/Air Quality Management Plans. To comply with the CAA in achieving the National Ambient Air Quality Standards (NAAQS), the California Air Resources Board (ARB) develops State Implementation Plans (SIPs) for federal non-attainment and maintenance areas. In California, SIP development is a joint effort of the local air agencies and ARB working with federal, State, and local agencies (including the MPOs). Local Air Quality Management Plans (AQMPs) are prepared in response to federal and State requirements. Since the CCAA does not specify attainment dates but rather requires meeting the California standards the earliest practicable date, SIPs in California typically serve as the control strategy to meet the more stringent State standards.

In California, all SIPs have to go through three steps: air district action, ARB action, and finally, USEPA action. Each air district submits its respective AQMPs/SIPs to ARB. ARB is the official State agency that submits the SIPs to USEPA for all federal non-attainment and maintenance areas in California.

Transportation Conformity. Transportation conformity is required under CAA section 176(c) to ensure that federally supported highway and transit project activities are consistent with ("conform to") the purpose and requirements of the SIP. Conformity currently applies to areas that are designated non-attainment, and those re-designated to attainment after 1990 ("maintenance areas" with plans developed under CAA section 175A) for the following transportation-related criteria pollutants: ozone, particulate matter (PM2.5 and PM10), CO, and NO_2. Conformity to the purpose of the SIP means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS. The transportation conformity regulation is found in 40 CFR Part 93.

Conformity requires reporting on the timely implementation of Transportation Control Measures (TCMs)[16] in ozone nonattainment areas designated as serious or worse, thus reinforcing the link between AQMP/SIPs and the transportation planning process. TCMS are expected to be given funding priority and to be implemented on schedule and, in the case of any delays, any obstacles to implementation have been or are being overcome. In the SCAG Region, there are two areas for which the ozone SIPS contain TCMs: SCAB and the Ventura County portion of SCCAB. (It is noted that the Ventura County SIP does not claim emission

[15] USEPA, Office of Compliance, Office of Enforcement and Compliance Assurance, *EPA Office of Compliance Sector Notebook Project: Air Transportation Industry*, October 1998.

[16] A TCM is any measure that is specifically identified and committed to in the applicable implementation plan, including a substitute or additional TCM that is incorporated into the applicable SIP through the process established in CAA section 176(c)(8), that is either one of the types listed in CAA section 108, or any other measure for the purpose of reducing emissions or concentrations of air pollutants from transportation sources by reducing vehicle use or changing traffic flow or congestion conditions. Notwithstanding the first sentence of this definition, vehicle technology-based, fuel-based, and maintenance-based measures which control the emissions from vehicles under fixed traffic conditions are not TCMs for the purposes of this subpart.

reduction credits from TCM projects. They have been included to assist transportation and air quality agencies to identify projects that have the potential of reducing vehicle emissions, vehicle trips and vehicle miles traveled.)

State

California Air Resources Board (ARB). In addition to being subject to the requirements of CAA, air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA). In California, the CCAA is administered by ARB at the State level and by the air quality management districts and air pollution control districts at the regional and local levels. ARB, which became part of the California Environmental Protection Agency in 1991, is responsible for meeting the State requirements of the CAA, administering the CCAA, and establishing the California Ambient Air Quality Standards (CAAQS). The CCAA, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain the CAAQS. CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles.

Unlike the NAAQS, there are no set attainment deadlines to achieve the CAAQS; however, these standards are to be met as expeditiously as possible. ARB regulates mobile air pollution sources, such as motor vehicles. ARB is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. ARB established passenger vehicle fuel specifications, which became effective in March 1996. ARB 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 levels. The State standards are summarized in **Table 3.2-1**.

The CCAA requires ARB to designate areas within California as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data shows that a State standard for the pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a State standard and are not used as a basis for designating areas as nonattainment. Under the CCAA, the Los Angeles County portion of the SCAB is designated as a nonattainment area for O_3, PM2.5, and PM10.[17]

Toxic Air Contaminants (TACs). ARB's statewide comprehensive air toxics program was established in the early 1980's. The Toxic Air Contaminant Identification and Control Act created California's program to reduce exposure to air toxics. Under the Toxic Air Contaminant Identification and Control Act, ARB is required to use certain criteria in the prioritization for the identification and control of air toxics. In selecting substances for review, ARB must consider criteria relating to "the risk of harm to public health, amount or potential amount of emissions, manner of, and exposure to, usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community" [Health and Safety Code Section 39666(f)]. the Toxic Air Contaminant Identification and Control Act also requires ARB to use available information gathered from the Air Toxics "Hot Spots" Information and Assessment Act program to include in the prioritization of compounds.

California has established a two-step process of risk identification and risk management to address the potential health effects from air toxic substances and protect the public health of Californians. During the first step (identification), ARB and the Office of Environmental Health Hazard Assessment (OEHHA) determine if a substance should be formally identified as a TAC in California. During this process, ARB and the OEHHA staff draft a report that serves as the basis for this determination. ARB staff assesses the potential for human exposure to a substance and the OEHHA staff evaluates the health effects. After ARB

[17] ARB, Area Designation Maps website, *http://www.arb.ca.gov/desig/adm/adm.htm*, accessed June 2, 2011.

and the OEHHA staff hold several comment periods and workshops, the report is then submitted to an independent, nine-member Scientific Review Panel (SRP), who reviews the report for its scientific accuracy. If the SRP approves the report, they develop specific scientific findings which are officially submitted to ARB. ARB staff then prepares a hearing notice and draft regulation to formally identify the substance as a TAC. Based on the input from the public and the information gathered from the report, the ARB Board decides whether to identify a substance as a TAC. In 1993, the California Legislature amended the Toxic Air Contaminant Identification and Control Act by requiring ARB to identify 189 federal hazardous air pollutants as State TACs.

In the second step (risk management), ARB reviews the emission sources of an identified TAC to determine if any regulatory action is necessary to reduce the risk. The analysis includes a review of controls already in place, the available technologies and associated costs for reducing emissions, and the associated risk.

The Air Toxics "Hot Spots" Information and Assessment Act (Health and Safety Code Section 44360) supplements the Toxic Air Contaminant Identification and Control Act by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks. The "Hot Spots" Act also requires facilities that pose a significant health risk to the community to reduce their risk through a risk management plan.

California's Diesel Risk Reduction Program. The ARB identified particulate emissions from diesel-fueled engines (diesel PM) as toxic air contaminants (TACs) in August 1998. Following the identification process, the ARB was required by law to determine if there is a need for further control, which led to the risk management phase of the program.

For the risk management phase, the ARB directed staff to form the Diesel Advisory Committee to assist in the development of a risk management guidance document and a risk reduction plan. With the assistance of the Advisory Committee and its subcommittees, the ARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles and the Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines. The Board approved these documents on September 28, 2000, paving the way for the next step in the regulatory process: the control measure phase.

During the control measure phase, specific Statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles have and continue to be evaluated and developed. The goal of each regulation 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.

Regional

The SCAG region incorporates four air basins and five air districts. The four air basins are the South Coast Air Basin (SCAB), the Mojave Desert Air Basin (MDAB), the Salton Sea Air Basin (SSAB), and the Ventura County portion of the South Central Coast Air Basin (SCCAB). The five air districts are the South Coast Air Quality Management District (SCAQMD), Mojave Desert Air Quality Management District (MDAQMD), Imperial County Air Pollution Control District (ICAPCD), Antelope Valley Air Pollution Control District (AVAPCD), and the Ventura County Air Pollution Control District (VCAPCD). The geographic boundaries of these air basins, districts and monitoring locations are shown in are shown in **Map 3.2-1** located in Chapter 8 (Maps). Each air district established regional air quality rules and regulations. In addition, the air districts are responsible for regulating stationary sources of air emissions that require permits (e.g., industrial land uses and gas stations).

EXISTING SETTING

This section provides the environmental setting for air quality in the SCAG region, which encompasses a population exceeding 18 million persons in an area of more than 38,000 square miles within the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura and Imperial. The section includes information on climate and meteorology for the air basins in the SCAG region and existing air quality. As previously discussed, the SCAG region includes four air basins: South Coast, Mojave Desert, Salton Sea and South Central Coast (Ventura County portion). Each air basin generally has similar meteorological and geographical conditions.

Climate and Meteorology

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography, influence the movement and dispersal of pollutants and thereby provide the link between air pollutant emissions and air quality.

South Coast Air Basin (SCAB). The SCAB incorporates approximately 12,000 square miles, consisting Orange County and the urbanized areas of San Bernardino, Riverside and Los Angeles counties. In May 1996, the boundaries of the SCAB were changed by the ARB to include the Beaumont-Banning area. In addition, the Southeast Desert Air Basin was separated into two areas and renamed as the Mojave Desert Air Basin and the Salton Sea Air Basin. The distinctive climate of the SCAB is determined by its terrain and geographic location. The SCAB is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the southwest and high mountains around the rest of its perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. The usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, or Santa Ana winds.[18]

The vertical dispersion of air pollutants in the SCAB is hampered by the presence of persistent temperature inversions. High-pressure systems, such as the semi-permanent high-pressure zone in which the SCAB is located, are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler marine-influenced air near the ground surface, and resulting in the formation of subsidence inversions. Such inversions restrict the vertical dispersion of air pollutants released into the marine layer and, together with strong sunlight, can produce worst-case conditions for the formation of photochemical smog. The basin-wide occurrence of inversions at 3,500 feet above sea level or less averages 191 days per year.[19]

The atmospheric pollution potential of an area is largely dependent on winds, atmospheric stability, solar radiation, and terrain. The combination of low wind speeds and low inversions produces the greatest concentration of air pollutants. On days without inversions, or on days of winds averaging over 15 miles per hour, smog potential is greatly reduced.[20]

Mojave Desert Air Basin (MDAB). The MDAB encompasses approximately 21,480 square miles and includes the desert portions of San Bernardino County, Palo Verde Valley, Palmdale and Lancaster in the Antelope Valley. The MDAB is bordered by the SCAB and the Riverside County line to the south, Kern County line to the west, the Arizona and Nevada borders to the north and east, and the eastern portion of Riverside County to the southeast. The Kern County portion of MDAB is not in the SCAG Region.

[18]SCAQMD, *CEQA Air Quality Handbook*, April 1993, p. A8-1.
[19]SCAQMD, *CEQA Air Quality Handbook*, April 1993, p. A8-2.
[20]*Ibid*.

The MDAB is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes.[21] Many of the lower mountains which dot the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada Mountains to the north; air masses pushed onshore in southern California by differential heating are channeled through the MDAB. The MDAB is separated from the southern California coastal and central California valley regions by mountains (highest elevation approximately 10,000 feet), whose passes form the main channels for these air masses. The Antelope Valley is bordered in the northwest by the Tehachapi Mountains, separated from the Sierra Nevadas in the north by the Tehachapi Pass (3,800 feet elevation). The Antelope Valley is bordered in the south by the San Gabriel Mountains, bisected by Soledad Canyon (3,300 feet). The Mojave Desert is bordered in the southwest by the San Bernardino Mountains, separated from the San Gabriel Mountains by the Cajon Pass (4,200 feet). A lesser channel lies between the San Bernardino Mountains and the Little San Bernardino Mountains (the Morongo Valley).

The Palo Verde Valley portion of the Mojave Desert lies in the low desert, at the eastern end of a series of valleys (notably the Coachella Valley) whose primary channel is the San Gorgonio Pass (2,300 feet) between the San Bernardino and San Jacinto Mountains.

During the summer the MDAB is generally influenced by a Pacific Subtropical High cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time the reach the desert. Most desert moisture arrives from infrequent warm, moist and unstable air masses from the south. The MDAB averages between three and seven inches of precipitation per year (from 16 to 30 days with at least 0.01 inches of precipitation). The MDAB is classified as a dry-hot desert climate, with portions classified as dry-very hot desert, to indicate at least three months have maximum average temperatures over 100.4° F.

Salton Sea Air Basin (SSAB). The SSAB includes all of Imperial County and the desert portion of Riverside County between the SCAB and the MDAB (known as the Coachella Valley area). Imperial County extends over 4,597 square miles, bordering on Mexico to the south, Riverside County to the north, San Diego County on the west, and the State of Arizona on the east.[22]

The southern portion of the SSAB is a part of the larger physiographic province of the Salton Trough. This province is a very flat basin surrounded by mountains: the Peninsular Ranges to the west, the Chocolate, Orocopia and Cargo Muchaco Mountains to the east. Most of the trough is below sea level, and consists generally of desert, with agricultural land uses located at the north and south of the Salton Sea.

Climatic conditions in the SSAB are governed by the large-scale sinking and warming of air in the semi-permanent subtropical high-pressure center of the Pacific Ocean. The high-pressure ridge blocks out most mid-latitude storms except in the winter when the high is weakest and farthest south. Similarly, the coastal mountains prevent the intrusion of any cool, damp marine air found in California coastal environs. Because of the weakened storms and the orographic barrier, the SSAB experiences clear skies, very low humidity, extremely hot summers, mild winters, and little rainfall. The flat terrain of the valley and the strong temperature differentials created by intense solar heating produce moderate winds and deep thermal convection.

The combination of subsiding air, protective mountains and distance from the ocean all combine to severely limit precipitation. Rainfall is highly variable with heavy precipitation occurring from single storms

[21]Mojave Desert Air Quality Management District, *CEQA and Federal Conformity Guidelines*, February 2009.

[22]Imperial County Air Pollution Control District, *Final 2009 1997 8-Hour Ozone Modified Air Quality Management Plan*, July 13, 2010.

followed by periods of dry air. Humidity is typically low throughout the year, ranging from 28 percent in summer to 52 percent in winter.

The SSAB occasionally experiences periods of high winds. Wind speeds exceeding 31 mph occur most frequently in April and May. On an annual basis, strong winds over 31 miles per hour are observed 0.6 percent of the time, speeds of less than 6.8 mph account for more than one-half of the observed winds. Wind statistics indicate prevailing winds are from the west-northwest through southwest; a secondary flow maximum from the southeast is also evident. Imperial County, in particular, experiences surface inversions almost every day of the year. Due to strong surface heating, these inversions are usually broken allowing pollutants to more easily disperse. Weak, surface inversions are caused by cooling of air in contact with the cold surface of the earth at night. In valleys and low-lying areas, this condition is intensified by the addition of cold air flowing downslope from the hills and pooling on the valley floor.

The presence of the Pacific high-pressure cell can cause the air mass aloft to sink. As the air descends, compressional heating warms it to a temperature higher than the air below. This highly stable atmospheric condition, termed a subsidence inversion can act as a nearly impenetrable lid to the vertical mixing of pollutants. The strength of these inversions makes them difficult to disrupt. Consequently, they can persist for one or more days, causing air stagnation and the buildup of pollutants. Highest or worst-case ozone levels are often associated with the presence of this type of inversion. Subsidence inversions are common from November through June, but appear to be relatively absent July through October.

South Central Coast Air Basin (SCCAB). The SCAG region includes the Ventura County portion of the SCCAB. Ventura County is comprised of coastal mountain ranges, the coastal shore, the coastal plain, and several inland valleys.[23] The northern half of the county (Los Padres National Forest) is extremely mountainous with altitudes up to 8,800 feet. Consequently, the climate in the northern half of the County varies a great deal depending on elevation. Therefore, the climatological and meteorological description presented for Ventura County focuses on the southern half of the county where violations of federal and State ozone standards occur. In the winter, low-pressure systems originating in the northern Pacific Ocean bring clouds, rain, and wind into Ventura County.

The average annual temperature in the coastal and inland valleys of the southern half of Ventura County ranges from the upper 50s at the coast (Point Mugu) to the mid-60s in Simi Valley. The difference between the maximum and minimum temperatures becomes greater as the distance increases from the coast. The average minimum and maximum temperatures at Point Mugu are 50°F and 60°F, respectively, while at the inland location of Simi Valley, the averages are 52°F and 77°F. The smaller range of temperatures at Point Mugu demonstrates the moderating influence of the ocean on air temperature. The ocean's ability to warm and cool the air while its temperature remains relatively unchanged produces the moderating effect. Inland area temperatures are more prone to rapid fluctuations. Almost all rainfall in Ventura County falls during the winter and early spring (November through April). Summer rainfall is normally restricted to scattered thundershowers in lower elevations, and somewhat heavier activity in the mountains. Humidity levels vary throughout the County. The range of humidity is primarily influenced by proximity to the ocean. Although the County's climate is semi-arid, average humidity levels are relatively high due to the marine influence. Coastal areas are more humid than inland areas during typical fair weather. The reverse is true during stormy periods. The lowest humidity levels are recorded during Santa Ana wind conditions.

Ventura County winds are dominated by a diurnal land-sea breeze cycle. The land-sea breeze regime is broken only by occasional winter storms and infrequent strong northeasterly Santa Ana wind flows. Since the sea breeze is stronger than the land breeze, the net wind flow during the day is from west to east. Under light land-sea breeze regimes, recirculation of pollutants can occur as emissions move westward during morning hours, and eastward during the afternoon. This can cause a build-up of pollutants over several days.

[23] VCAPCD, *1994 Air Quality Management Plan*, November 1996.

The vertical dispersion of air pollutants in Ventura County is limited by the presence of persistent temperature inversions. Approximately 60 percent of all inversions measured at Point Mugu are surface-based, with most occurring during the morning hours.

Existing Air Quality

The five air districts in the SCAG region each monitor air quality conditions in their region. **Table 3.2-2** presents the peak readings of criteria pollutants in the SCAG air basins. The data shows that O_3, PM2.5 and PM10 readings consistently exceeded the standards in each of the air basins. In addition, the PM2.5 standard was exceeded multiple times in the SCAG region.

Map 3.2-2 located in Chapter 8 (Maps), shows the average daily O_3 exposure that is in excess of the national 8-hour standard (0.075 parts per million) in the SCAG Region for years 2007 to 2009. Although the region as a whole largely experiences average daily ozone exposure exceeding the federal standard, the highest concentration of O_3 exposure can be seen mostly in southwest San Bernardino and northwest Riverside counties, and also in north Los Angeles County. **Map 3.2-3** located in Chapter 8 (Maps) shows the average annual exposure to PM2.5 for years 2007 to 2009. South Los Angeles County, northeast Orange County, southwest San Bernardino County, and northwest Riverside County experienced the highest average annual exposure to PM2.5, with average rates ranging from 14.6 to 21.4 micrograms of PM2.5 per cubic meter of air. Other high exposure areas include North Los Angeles County, east Ventura County (along the US-101 corridor), central Orange County, central Riverside County (Coachella Valley), and central Imperial County (Imperial Valley basin). Also included in this group are the areas in San Bernardino and Riverside County that are directly outside of the highest intensity areas identified previously that fall between the SR-74, I-15, and I-215 corridors.

The impact of ozone and particulate emissions on health can often be seen in the instances of cancer or poor respiratory health in a designated geographic area. The rate of cancer risk per one million people as a result of emissions in the SCAG region is displayed in **Map 3.2-4** located in Chapter 8 (Maps). The highest instance of cancer risk is exhibited in the area in and around Downtown Los Angeles, along the I-10 and SR-60 highways in San Bernardino County, at the SR-91/I-15, SR-91/I-215 intersections in Riverside County, and at the SR-57/SR-22 intersection in Orange County.

Other areas that have high instances of cancer risk in the SCAG Region are south Ventura County, south and central Los Angeles County, southwest San Bernardino County, northwest Riverside County, and all of Orange County. In addition to cancer risk, respiratory risk is also an indicator of emissions impact on public health. **Map 3.2-5** located in the Chapter 8 (Maps) shows respiratory risk in the SCAG Region. The highest areas of respiratory risk are the segments that closely follow major freeways in the most urbanized portions of the region, with the areas surrounding Downtown Los Angeles showing the highest geographic concentration of respiratory risk in the region. Respiratory risk is also present in the urbanized portions of south Ventura County, south and central Los Angeles County, southeast San Bernardino County, northwest Riverside County, Orange County, and central Imperial County.

Maps 3.2-4 and **3.2-5** are based on 2005 data and show a reasonable representation of the spatial variation of cancer and respiratory risk. The existing risk in the current year is less than presented in these maps because of State regulations implemented since 2005 designed to reduce mobile source toxic emissions. Therefore, **Maps 3.2-4** and **3.2-5** show a conservative quantitative estimate of regional risk.

Rail engines generate emissions of diesel particulate matter and other cancer-causing toxics. **Map 3.2-6** located in Chapter 8.0 (Maps) shows sensitive receptors located along regional rail lines. **Map 3.2-7** located in Chapter 8.0 (Maps) shows regional 2005 cancer risk as it relates to rail lines. Above-average cancer risk is often located near rail lines.

TABLE 3.2-2: PEAK CRITERIA POLLUTANTS READINGS FOR THE SCAG REGION AIR BASINS

Pollutant	Period	Pollutant Standards		2008 Peak Criteria Reading		Days in Excess of Standards 2008		2009 Peak Criteria Reading		Days in Excess of Standards 2009		2010 Peak Criteria Reading		Days in Excess of Standards 2010	
		CA	Federal			CA	Federal			CA	Federal			CA	Federal
SOUTH COAST AIR BASIN															
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m^3)	--	0.176		102	28	0.176		102	15	0.143		85	9
	8-hour	0.07 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	0.131		140	119	California 0.129	Federal 0.128	131	113	0.123		124	102
Respirable Particulate Matter (PM10)	24-hour	50 µg/m^3	150 µg/m^3	California 126	Federal 144.2	46	0	California 105	Federal 147.1	33	0	California 87	Federal 89	23	0
Fine Particulate Matter (PM2.5)	24-hour	--	35 µg/m^3	78.3		--	26	California 82.9	Federal 72	--	28	California 67.8	Federal 54.2	--	13
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	4.33		0	0	4.61		0	0	3.58		0	0
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (338 µg/m^3)	100 ppb (190 µg/m^3)	0.125		0	--	0.115		0	--	0.118		0	--
MOJAVE DESERT AIR BASIN															
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m^3)	--	0.140		71	5	0.123		51	0	0.137		46	3
	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	0.110		134	107	0.104		120	87	0.114		121	91
Respirable Particulate Matter (PM10)	24-hour	50 µg/m^3	150 µg/m^3	California 144.8	Federal 285.5	3	2	California 81	Federal 307.2	2	1	California 829	Federal 868	2	1
Fine Particulate Matter (PM2.5)	24-hour	--	35 µg/m^3	26.8		--	0	20		--	0	California 20.0	Federal 19.5	--	0
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	1.23		0	0	1.14		0	0	5.17		0	0
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (338 µg/m^3)	100 ppb (190 µg/m^3)	0.081		0	--	0.065		0	--	0.137		0	--

TABLE 3.2-2: PEAK CRITERIA POLLUTANTS READINGS FOR THE SCAG REGION AIR BASINS

Pollutant	Period	Pollutant Standards		2008 Peak Criteria Reading		Days in Excess of Standards 2008		2009 Peak Criteria Reading		Days in Excess of Standards 2009		2010 Peak Criteria Reading		Days in Excess of Standards 2010	
		CA	Federal			CA	Federal			CA	Federal			CA	Federal
SALTON SEA AIR BASIN															
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m^3)	--	0.135		36	1	0.150		40	2	0.122		24	0
	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	0.101		85	57	0.098		82	59	0.099		94	62
Respirable Particulate Matter (PM_{10})	24-hour	50 µg/m^3	150 µg/m^3	California 138	Federal 336.7	31	3	California 265.8	Federal 275.9	34	3	California 117.3	Federal 144.8	43	0
Fine Particulate Matter ($PM_{2.5}$)	24-hour	--	35 µg/m^3	California 93.6	Federal 37.1	--	1	California 100.9	Federal 45	--	4	California 54	Federal 50.9	--	2
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	6.34		0	0	7.46		0	0	9.69		1	1
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (338 µg/m^3)	100 ppb (190 µg/m^3)	0.146		0	--	0.122		0	--	0.141		0	--
SOUTH CENTRAL COAST AIR BASIN															
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m^3)	--	0.115		24	0	0.116		15	0	0.104		6	0
	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	0.097		96	63	0.095		54	29	California 0.091	Federal 0.090	44	23
Respirable Particulate Matter (PM_{10})	24-hour	50 µg/m^3	150 µg/m^3	California 109	Federal 88.6	44	0	California 125.9	Federal 119.2	13	0	California 144.3	Federal 167.8	45	1
Fine Particulate Matter ($PM_{2.5}$)	24-hour	--	35 µg/m^3	California 61.1	Federal 44.2	--	2	California 36	Federal 51.6	--	2	California 42.4	Federal 32.6	--	0
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	1.70		0	0	1.57		0	0	1.07		0	0
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (338 µg/m^3)	100 ppb (190 µg/m^3)	0.077		0	--	0.052		0	--	0.090		0	--

SOURCE: ARB, Historical Air Quality Data, 2011.

THRESHOLDS OF SIGNIFICANCE

The 2012-2035 RTP/SCS would have a significant impact related to air quality in the following circumstances:

- Projected long-term emissions of criteria pollutants are considered significant if they are substantially greater than current emission levels;
- Projected short-term emissions of criteria pollutants (construction of transportation projects and anticipated development) are considered to be significant if they would exceed the thresholds established by the local air districts;
- Projected long-term emissions of toxic air contaminants (diesel particulate matter from heavy-duty diesel trucks and other emissions from industrial activities) are considered significant if they would be greater than current emission levels;
- Localized concentrations of toxic air contaminants at sensitive receptors (short-term and/or long-term) are considered significant if they would exceed existing conditions; and/or
- Projected long-term emissions would be considered to be cumulatively significant if they are not consistent with the local air quality management plans and state implementation plans.
- If the Plan could increase the number of people residing in areas within 500 feet of rail and freeway facilities compared to existing conditions, with the potential to expose them to substantially higher than average cancer and other health risks, the impact is considered significant.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the Plan on air quality.[24]

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan [AQMP]), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of air quality includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan (No Project Alternative) were adopted. This evaluation is not included in the determination of the significance of impacts (which is based on a comparison of future conditions with the Plan to existing conditions); however, it provides a meaningful perspective on the effects of the Plan.

[24]The Environmental Justice section of the Plan and associated appendix contains substantial analysis of potential air quality impacts to low income, minority and other protected groups. See Environmental Justice Appendix of the 2012-2035 RTP/SCS. However, the PEIR does not rely on this analysis as it addresses air quality impacts to the community as a whole.

Determination of Significance

The methodology for determining the significance of air quality impacts compares the existing conditions to the future 2012-2035 RTP/SCS conditions, as required in CEQA Section 15126.2(a).

Analysis of the potential air quality impacts of the Plan was conducted based on detailed modeling of on-road sources. Regional emissions from stationary and other sources are summarized from the SCAQMD AQMP and associated EIR (the most recently available information as of publication of this Draft PEIR; the AQMP and associated EIR will be updated in 2012). A mobile source health risk assessment has also been completed. Because Plan and cumulative emissions are interrelated, cumulative emissions are discussed together with Plan emissions.

IMPACTS

Impact 3.2-1: Mobile source emissions of ROG, NO_X, CO, PM 10 PM2.5, and SO_X would stay approximately the same or decrease (often substantially) when compared to existing conditions. This is considered to be a beneficial impact. Re-entrained roadway dust would increase proportionate to VMT. This would be a significant impact.

Projected long-term emissions of criteria pollutants are considered significant if they are substantially greater than the current emission levels.[25]

Criteria Pollutant Emissions Analysis

To assess the effectiveness of the improvements proposed in the Plan, estimated air emissions for the buildout year (2035) of the Plan were compared to the 2012 conditions. The calculated emissions were compiled for each county in the SCAG region.

Re-entrained roadway dust as well as roadway construction dust emissions are included in the estimation of criteria pollutant emissions for PM10 and PM2.5 for non-attainment and maintenance areas where AQMD/APCDs include inventories in their State Implementation Plans (SIPs) but are not available for the entire SCAG region (see the Transportation Conformity Appendix to the 2012-2035 RTP/SCS page 16). Thus, re-entrained road dust is accounted for in the attainment demonstrations of applicable PM10 and PM2.5 SIPs. As shown in SCAG's conformity analysis, PM10 and PM2.5 emissions meet applicable emissions budgets for the build/no build interim test (for those areas where there is no emission budget) and thus conform to the SIPs.

Re-entrained dust (PM10 and PM2.5) would be generated by roadway activity (i.e., roadway dust kicked up by moving vehicles on paved and unpaved roadways). In addition roadway construction dust and dust from construction activity, and agricultural activity would add to regional dust levels. Re-entrained roadway dust is proportional to total VMT which is expected to increase under the Plan as compared to existing conditions and, as such, re-entrained roadway dust would increase. Expected growth would also lead to new construction which, in turn, would increase regional dust. These construction emissions, although unavoidable, would be partially controlled by air districts fugitive dust rules. The compact development pattern under the Plan may result in more open/agricultural space remaining and therefore current problems with wind blown dust off agricultural fields would remain if more land stays in agricultural/open space uses under the Plan as compared to the No Project Alternative.

[25] 2012 modeled conditions are used to approximate 2011 conditions as they are readily available and are close to 2011.

Table 3.2-3 summarizes the current and projected mobile source criteria pollutant emissions estimated for the Plan as compared to the current conditions by county. As shown in **Table 3.2-3**, emissions of ozone precursors NO_X and ROG would experience a dramatic improvement over existing conditions under the Plan.

In addition, CO and PM2.5 (other than re-trained roadway and construction dust) emissions would improve over existing conditions. SO_X emissions would increase in every county but Ventura. This is not considered to result in a significant impact as the entire SCAG region is well below State and federal SO_2 standards and designated as an attainment area. Implementation of Mitigation Measures **MM-AQ1** through **MM-AQ18** would further reduce criteria pollutant emissions. Impacts are considered significant because of the increase in PM10 as a result of re-entrained roadway dust (despite the fact that as noted above applicable conformity budgets and build/no build tests would be met).

Maps 3.2-8 and **3.2-9** located in Chapter 8.0 (Maps) show that the Plan would generally have fewer PM and CO emissions along freeways as compared to the No Project Alternative.

Impact 3.2-2: Under the Plan, carcinogenic health risk related to air toxics within any given distance of mobile sources in the region would decrease when compared to existing conditions. Total acute and chronic risk associated with criteria pollutants from mobile sources at given distances would also decrease when compared to existing conditions. Non-carcinogenic health incidences due to VMT-related re-entrained dust would increase under the Plan. However, increases in these health incidences would be at least partially offset by the decrease in health incidences related to air toxics and criteria pollutants generated by vehicle exhaust. (See also Impact 3.2-3 related to shifting populations.)

Regional Cancer Risk

Cancer risk in the region results from a number of sources including industrial sources, contaminated sites, as well as common carcinogens found in the home (many cleaning products, gasoline, paints, etc.). Mobile sources are a major source of cancer risk. As discussed above regional PM10 and PM2.5 from exhaust and tire wear would be expected to be similar to today, although re-entrained roadway dust would be expected to increase proportionate with VMT.

A review of air pollution studies by ARB indicates that residing close to freeways or busy roadways may result in adverse health effects beyond those typically found in urban areas. Several studies found an association between adverse non-cancer health effects (e.g., asthma) and living or attending school near heavily traveled urban roadways; however, these studies also found that the roadway and truck traffic densities were key factors affecting the strength of association with adverse health impacts. For urban roadways, the association of traffic-related emissions with adverse health impacts was generally strongest between 300 and 1,000 feet.

ARB reports that Diesel Particulate Matter (DPM) represents about 70 percent of the potential cancer risk from vehicle travel on a typical urban freeway. As shown in **Table 3.2-4,** exhaust from heavy-duty trucks is anticipated to decrease in all areas of the region as compared to today; thus DPM associated with freeways will also decrease as compared to today.

TABLE 3.2-3: CRITERIA POLLUTANT EMISSIONS BY COUNTY – EXISTING CONDITIONS (2012) VS PLAN (2035)

County		Tons/Day								
		ROG Summer	ROG Annual	NO_x Summer	NO_x Annual	NO_x Winter	CO Winter	PM10 Annual	PM2.5 Annual	SO_x Annual
Los Angeles /a/	Existing	96	94	199	203	218	902	14	9	1
	Plan	42	41	70	71	75	299	12	8	1
	Difference	(54)	(54)	(129)	(132)	(143)	(603)	(1)	(1)	0
Imperial	Existing	5	4	14	13	14	34	1	1	0
	Plan	4	3	9	9	9	24	1	1	0
	Difference	(1)	(1)	(4)	(4)	(5)	(10)	0	0	0
Orange	Existing	31	30	52	53	58	280	4	3	0
	Plan	14	14	19	19	20	96	4	3	0
	Difference	(16)	(16)	(34)	(34)	(38)	(184)	0	0	0
Riverside /b/	Existing	26	23	76	76	80	227	5	4	0
	Plan	15	13	35	35	36	114	5	3	1
	Difference	(11)	(10)	(41)	(41)	(44)	(113)	0	0	0
San Bernardino /c/	Existing	28	25	81	81	85	251	5	4	0
	Plan	15	13	37	37	38	114	5	3	0
	Difference	(13)	(12)	(44)	(44)	(47)	(137)	0	0	0
Ventura	Existing	10	10	16	16	18	83	1	1	0
	Plan	4	4	5	6	6	27	1	1	0
	Difference	(5)	(5)	(10)	(11)	(12)	(56)	0	0	0

/a/ Los Angeles County excludes Antelope Valley
/b/ Riverside County includes portions of the SCAB, MDAB and Coachella Valley
/c/ San Bernardino County includes the SCAB and MDAB portions
SOURCE: SCAG Transportation Modeling, 2011.

TABLE 3.2-4: PM10 EMISSIONS EXHAUST ONLY FOR HEAVY-DUTY TRUCKS PER COUNTY

	Tons/Day					
Scenario	**Los Angeles**	**Imperial**	**Orange**	**Riverside**	**San Bernardino**	**Ventura**
2012 Existing	3.7	0.4	0.6	2.1	2.2	0.2
2035 No Project	2.0	0.3	0.4	1.0	1.2	0.1
2035 Plan	2.1	0.3	0.4	1.1	1.2	0.1

SOURCE: SCAG Transportation Modeling 2011.

Respiratory and Other Particulate Matter Health Effects

Ambient PM10 and PM2.5, of which DPM is one component, have been associated with acute (short-term) and chronic (long-term) health effects, such as the worsening of heart and lung diseases. Elevated levels of ambient particulate matter have also been identified as one of many aggravating factors for childhood asthma. PM10 and PM2.5 are a health concern, particularly at levels above the federal and State ambient air quality standards. PM2.5 is thought to have greater effects on health because smaller particles are able to penetrate to the deepest parts of the lungs.

Scientific studies have suggested links between fine particulate matter and numerous health problems, including asthma, bronchitis, and acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Children are more susceptible to the health risks of PM2.5 because their immune and respiratory systems are still developing. Very small particles of certain substances (e.g., sulfates and nitrates) can also directly cause lung damage or can contain absorbed gases (e.g., chlorides or ammonium) that may be injurious to health.

On-road vehicle traffic also produces particulate matter in the form of brake and tire wear and re-entrained roadway dust. This type of dust is comprised mainly of large particles (diameter greater than 10 microns) that settle out rapidly and are more easily filtered by human breathing passages. All dust, however, including some fraction of PM10 and PM2.5 can create localized health impacts (i.e., exceed an ambient air quality standard). Ambient concentrations of PM10 and PM2.5 are regulated directly through health-based ambient air quality standards. As with construction-related impacts, PM10 and PM2.5 impacts will be addressed on a project-by-project basis, rather than in this PEIR.

All of these factors contribute to health incidences and costs associated with air pollution from auto travel. Auto-related air pollution results in a spectrum of health incidences, including cases of chronic bronchitis; acute myocardial infarction; respiratory and cardiovascular hospitalizations; respiratory-related ER visits; acute bronchitis; work loss days; premature mortality; asthma exacerbation; and acute, lower, and upper respiratory symptoms.

Brake and tire wear and fugitive dust from paved road travel emissions are directly related to VMT. As VMT increases so does roadway PM10 and PM2.5. The Plan would increase VMT when compared to existing conditions. However, decreased regional pollution due to Plan implementation and decreased DPM emissions would improve overall regional health when compared to existing conditions. Specifically, **Table 3.2-5** shows avoided health incidences per ton of pollutant and **Table 3.2-6** shows avoided health costs per ton of pollutant.

TABLE 3.2-5 AVOIDED HEALTH INCIDENCES PER TON OF POLLUTANT (2035)				
Health Incidences	**PM2.5**	**SO_X**	**ROG/VOC**	**NO_X**
Premature Mortality	0.07631	0.00619	0.00096	0.00612
Chronic Bronchitis	0.03417	0.00276	0.00035	0.00264
Acute Myocardial Infarction	0.07272	0.00609	0.00076	0.00565
Hospitalization: Respiratory	0.00882	0.00072	0.00096	0.00156
Hospitalization: Cardiovascular	0.01982	0.00165	0.00021	0.00154
Emergency Room Visits (respiratory related)	0.01754	0.00142	0.00045	0.00162
Acute Bronchitis	0.0875	0.00709	0.00089	0.00671
Work Loss Days	6.48295	0.51187	0.20329	0.63809
Asthma Exacerbation	0.95418	0.07681	0.20071	0.26441
Acute Respiratory Symptoms	38.23382	3.02214	0.38744	2.95034
Lower Respiratory Symptoms	1.04022	0.08416	0.0106	0.07988
Upper Respiratory Symptoms	0.78766	0.06357	0.00801	0.06068
SOURCE: TIAX LLC prepared for the American Lung Association of California, 2011.				

TABLE 3.2-6: AVOIDED HEALTH COSTS PER TON OF POLLUTANT (2035)	
Pollutant	**2010 (Dollars per Ton)**
NOx (as component of ozone)	$1,648
VOC (as component of ozone)	$1,648
PM2.5	$756,413
Indirect PM: NOx	$58,841
Indirect PM: SOx	$61,386
Indirect PM: ROG/VOC	$7,778
SOURCE: TIAX LLC prepared for the American Lung Association of California, 2011.	

As noted in the Environmental Setting, rail engines generate emissions of diesel particulate matter and other cancer-causing toxics. **Map 3.2-6** located in Chapter 8.0 (Maps) shows sensitive receptors located along regional rail lines. **Map 3.2-7** located in Chapter 8.0 (Maps) shows regional 2005 cancer risk as it relates to rail lines. As with freeway corridors, above-average cancer risk is often located near rail lines.

Freeway Corridor Analysis

A mobile source HRA was completed for freeways corridors under the Plan. The analysis assessed at least one freeway corridor in each of the six counties contained in the SCAG planning area. To focus on the maximum risks, the segment within each corridor that exhibited the highest daily total traffic volumes were identified and quantitatively modeled for increased cancer risk. The selected segments include:

- I-405 – in Seal Beach, east of the I-605 interchange (Orange County)
- I-710 – in Compton, north of the intersection with SR-91 (Los Angeles County)
- I-8 – in El Centro (Imperial County)
- SR-60 – in Ontario, west of the I-15 interchange (San Bernardino County)
- SR-91 – west of Corona, east of the intersection with SR-71 (Orange County, just west of Riverside County)
- U.S. 101 – in Thousand Oaks, east of SR-23 (Ventura County)
- SR-60 near Diamond Bar (Los Angeles County)
- I-15 in Ontario (San Bernardino County).

Diesel- and gasoline-powered vehicle emissions contain many compounds that have been determined to be carcinogenic. Only a few compounds, however, are emitted in sufficient quantities to contribute to significant cancer risks in areas immediately downwind of roadway segments affected by the Plan. Foremost among these compounds is diesel exhaust particulate matter (DPM), based on its designation as a toxic air contaminant by ARB. The gaseous organic compounds that significantly contribute to cancer risk include 1,3 butadiene, benzene, formaldehyde, and acetaldehyde.

Emission factors for these pollutants from operation of on-road vehicles were developed using the most recent emission factor model developed by the USEPA and CARB. On-road emission factors for DPM and total organic gas (TOG) emissions were generated through use of the ARB EMFAC2007 model. A special toxics module of USEPA's MOBILE6.2 model was used to determine the fractions of individual cancer-causing toxic compounds listed above in TOG emissions, a capability not possessed by the EMFAC2007 model.

SCAG's travel demand modeling system produces estimates of roadway link volumes for light/medium-duty vehicles (e.g., passenger cars and trucks and light/medium commercial vehicles) and heavy-duty vehicles. Since 90 to 95 percent of the TOG toxic emissions come from light/medium-duty vehicles and similar percentages of DPM are emitted by heavy-duty vehicles, emission factors from the EMFAC2007 runs (and MOBILE6 toxic fraction breakdowns) were compiled separately for light/medium duty vehicles and heavy-duty vehicles for each county/area. This approach accounted for variations in the mix of heavy-duty vehicles across roadway links contained in SCAG's travel model outputs and the relative impacts of each compound on overall cancer risk.

The quantification of cancer risk impacts resulting from vehicle operation in the vicinity of each of the selected freeway corridors in the Plan was performed using a USEPA-approved American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee-developed AERMOD modeling system. The meteorological databases recommended for use are those compiled by SCAQMD for calendar year 2005 through 2007 from 26 stations within the SCAB.

Residential cancer risk is expressed in units of increased cancer risk per 70-year exposure. Based on OEHHA guidance for workplace vs. residential exposure, the ARB's Hotspots Analysis and Reporting Program (HARP) model also produces cancer risk results based on workplace exposure. While residential risk assessment assumes 24 hour/day, 7 day/week, 52 week/year, 70-year exposure, HARP uses default workplace exposure assumptions of 8 hours per day and 245 days per year over a 40-year period.

Several simplifying assumptions were made in the health risk assessment. First, the analysis focused only on quantifying increased cancer risks—acute and non-cancer chronic health risks and mortality risks were not considered. Additionally, cancer risk values represent risk based on 70 years of exposure. However, calendar year 2035 emission factors are assumed to persist for years within the 70-year period beyond 2035, since regulations mandating future emissions reductions do not call for any new restrictions beyond 2018. If vehicle emission technology improvements continue, use of 2035 fleet emission factors to represent emissions beyond 2035 will produce conservatively higher average fleet emissions over the 70-year period than actually occur, and cancer risks for future scenarios will be conservatively over-predicted.

The HARP model reports maximum residential and workplace cancer risk at any receptor, referred to as the Maximum Exposed Individual (MEI). The cancer risks reported for each highway segment and planning scenario are for the MEI, even if no residence or workplace actually exists at the location of the MEI. This conservative assumption is designed to overestimate cancer risk. For the analysis of freeway segment operations, the cancer risk values reported by the model represent the chance of contracting cancer from exposure to freeway emissions if a person lived at the same location for a period of 70 years or worked at the same location for 40 years and if freeway emissions did not change over those periods. These risk values reflect only exposure to emissions from freeway traffic and do not include cancer risk due to other sources.

The residential cancer risk values reported for the hypothetical location of the maximum exposed individual for each of the five planning scenarios and each of the eight freeway segments studied are presented in **Table 3.2-7**. **Table 3.2-8** presents a similar summary of maximum cancer risks based on workplace exposure along each modeled corridor.

The maximum residential and workplace risks due to vehicle operation on all freeway segments are much higher under existing (2012) conditions than under the Plan. The declines in cancer risk across all freeway segments are the result of continued decreases in per-vehicle mile fleet emissions projected to occur over the next 23 years. This decrease occurs due to continued emission control technology improvements in new vehicles for which certification standards continue to tighten up through 2018.

Table 3.2-9 presents the distances from roadway boundaries at which maximum residential cancer risks drop by 50 and 90 percent. The 50 percent drop occurs at an average distance of 371 feet and the 90 percent drop occurs at an average distance of 2,009 feet.

TABLE 3.2-7: MAXIMUM CANCER RISK BASED ON RESIDENTIAL EXPOSURE TO VEHICLE OPERATION BY PLANNING SCENARIO AND FREEWAY CORRIDOR

Planning Scenario	Maximum Cancer Risk Over 70-Year Residential Exposure (in one million)							
	I-405 (Orange)	I-710 (Los Angeles)	I-8 (Imperial)	SR-60 (San Bernardino)	SR-91 (Riverside)	US-101 (Ventura)	SR-60 (Los Angeles)	I-15 (San Bernardino)
2012 Existing Conditions	1,080	1,040	503	1,770	1,960	372	1,470	811
2035 No Project	442	734	385	735	943	201	562	368
2035 Plan	462	475	399	714	668	199	536	354

SOURCE: Sierra Research, 2011.

TABLE 3.2-8: MAXIMUM CANCER RISK BASED ON WORKPLACE EXPOSURE TO VEHICLE OPERATION BY PLANNING SCENARIO AND FREEWAY CORRIDOR

Planning Scenario	Maximum Cancer Risk Over 70-Year Residential Exposure (in one million)							
	I-405 (Orange)	I-710 (Los Angeles)	I-8 (Imperial)	SR-60 (San Bernardino)	SR-91 (Riverside)	US 101 (Ventura)	SR-60 (Los Angeles)	I-15 (San Bernardino)
2012 Existing Conditions	163	158	76	269	297	56	223	123
2035 No Project	67	111	58	111	143	30	85	56
2035 Plan	70	72	60	108	101	30	81	54

SOURCE: Sierra Research, 2011.

TABLE 3.2-9: APPROXIMATE DISTANCES AT WHICH CANCER RISKS ARE REDUCED BY 50 AND 90 PERCENT

Freeway Corridor	50% Reduction Distance	90% Reduction Distance
I-15 (San Bernardino County)	200	1,750
I-405 (Orange County)	390	1,980
I-710 (Los Angeles County)	470	2,500
I-8 (Imperial County)	410	1,500
SR-60 (San Bernardino County)	390	1,990
SR-91 (Riverside County)	460	2,410
SR-60 (Los Angeles County)	310	2,250
U.S. 101 (Ventura County)	340	1,690

SOURCE: Sierra Research, 2011.

Table 3.2-10 presents a sample calculation of the contribution of each TAC to total cancer risk for a single freeway link. This calculation shows that cancer risk from DMP accounts for approximately 96 percent of the cancer risk on this link.

TABLE 3.2-10: SAMPLE CALCULATION OF CANCER RISK DUE TO DPM ON I-15

TOG	Cancer Risk (per µg/m^3)	Emission Rate (g/s)	Cancer Risk	
			Per µg/m^3 per g/s	Percent of Total
Acetaldehyde	3.77E-06	3.72E-03	1.40E-08	0.1
Benzene	3.77E-05	2.92E-03	1.10E-07	1.0
1,3-Butadiene	2.26E-04	1.09E-03	2.45E-07	2.3
Formaldehyde	7.91E-06	3.59E-03	2.84E-08	0.3
DPM	4.15E-04	2.48E-02	1.03E-05	96.3
		Total	**1.07E-05**	**100**

SOURCE: Sierra Research, 2011.

ARB reviewed studies that found measured air pollution concentrations from motor vehicles drop off dramatically between the source and 500 feet. The above analysis is consistent with ARB air quality modeling and risk analyses performed for freeways. The estimated risk from DPM exposure was found to vary substantially due to meteorology: typical downwind areas had much higher risk than upwind areas. Freeways with low truck volumes had lower risks than those with higher truck volumes. ARB based its 500-foot buffer recommendation on a review of several studies and air dispersion modeling. ARB's modeling was based on year 2000 truck and automobile information that included higher DPM emissions rates. New vehicle standards, gasoline and Diesel fuel reformulation, and ARB-adopted Diesel Risk Reduction Measures have resulted in lower potential cancer risks near freeways. As shown by the reductions in cancer risk projected to occur between existing conditions and the Plan in 2035, these risk reduction measures will continue to reduce toxic emissions from motor vehicles and resulting cancer risks.

Impact 3.2-3: Potential to increase population within 500 feet of transportation facilities that could expose residents (schools and other sensitive receptors) to elevated (as compared to average) cancer and other health risks.

As discussed in Chapter 2, Project Description, as a result of SCS policies the anticipated growth pattern would concentrate population adjacent to transit and other transportation facilities in High Quality Transit Areas (HQTAs) that could result in more people being exposed to elevated cancer risk as compared to areas of the region more distant from such facilities. Therefore under the Plan more sensitive receptors would be located adjacent to transportation facilities and would therefore be exposed to transportation-related air toxics.

While as a result of on-going emission controls, cancer and other health risks within any given distance of mobile sources in the region would decrease substantially (see Impact 3.2-2 above), the health risks adjacent to transportation facilities would remain higher than regional averages and above desirable levels. The existing population within 500 feet of freeways is about 1,082,000. In 2035 under the Plan the population would be 1,283,000; without the Plan the population would be about 1,261,000. The 2008 population within 500 feet of railroads is about 962,000. In 2035 under the Plan the population would be about 1,159,000 and without the Plan the population would be about 1,078,000.

As noted in the discussion of Environmental Setting above, the population residing close to freeways or busy roadways may experience adverse health effects beyond those typically found in urban areas. Several studies found an association between adverse non-cancer health effects (e.g., asthma) and living or attending school near heavily traveled urban roadways. Studies also found that the roadway and truck traffic densities were key factors affecting the strength of association with adverse health impacts. For urban roadways, the association of traffic-related emissions with adverse health impacts was generally strongest between 300 and 1,000 feet. As discussed above, proximity to freeways increases cancer risk and exposure to particulate matter. Similarly proximity to heavily travelled rail corridors would expose residents to high levels of DPM. Mitigation Measure **MM-AQ19** would reduce this impact to a less-than-significant level.

Impact 3.2-4: Emissions of short-term criteria pollutants would increase under the Plan as a result of construction of Plan transportation projects and development in the region. Therefore the Plan would result in a significant impact related to construction emissions.

The Plan would involve substantial construction to implement Plan projects. In addition, construction of development that constitutes regional growth would also generate substantial emissions. While each project would result in only short-term emissions, the construction industry itself comprises one component of stationary and area source emissions addressed in the AQMPs.

Construction activities in the region would create air emissions from the following activities: (1) demolition; (2) site preparation operations (grading/excavation); (3) fuel combustion from the operation of construction equipment; (3) delivery and hauling of construction materials and supplies to and from sites; (4) the use of asphalt or other oil based substances during the final construction phases of projects; and (5) travel by construction workers to and from sites.

Construction emissions are site-specific and are based on the type and magnitude of development that would be accommodated under the project, the timeline for construction, the mix of construction equipment required to build the project, and emission factors from the SCAQMD *CEQA Air Quality Handbook* and USEPA's AP-42. Emissions of NOx, VOC, and PM10 depend upon number and type of operating vehicles and the number of hours of operation. Fugitive emissions depends upon the amount of soil disturbed, type of soil, duration, type of activity (grading, excavation, etc.), haul trips and other factors.

Most improvements in transit and system management (signal synchronization, striping, etc.) do not involve construction and are not expected to generate short-term impacts. However, a number of the projects in the Plan would involve construction activities (new goods movement capacity enhancements, arterials, and rail systems). It is very likely that some of these projects would be under concurrent construction throughout the region. Short-term construction impacts generated from the implementation of the Plan are expected to be significant. The SCAQMD has developed thresholds of significance for individual construction projects within their jurisdiction. These thresholds are shown in **Table 3.2-11**.

TABLE 3.2-11: SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS FOR CONSTRUCTION	
Pollutant	**Mass Daily Threshold (Pounds/Day)**
NO_x	100
VOC	75
PM10	150
PM2.5	55
SO_x	150
CO	550
Lead (Pb)	3
SOURCE: SCAQMD, *CEQA Air Quality Handbook*, 1993.	

Other air quality management districts within the SCAG region have adopted similar thresholds for individual construction projects for criteria pollutants. Project-level analysis conducted for CEQA purposes would estimate construction emissions for each project based on project specifics. Mitigation measures to reduce air quality impacts would be established in project-specific environmental documents. The construction of highways or arterials would be expected to generate a significant amount of construction activity and therefore exceed the significance thresholds established in the *CEQA Air Quality Handbook*. These impacts would occur in localized areas depending on the construction site locations. Individual projects would be required to implement mitigation measures to reduce construction emissions. Other construction impacts include potential construction-related traffic impacts due to congestion from lane closures. These impacts should be addressed at the project level analysis.

The overall impact of the Plan due to construction of transportation-related projects would create substantial emissions. Implementation of Mitigation Measures **MM-AQ1** through **MM-AQ18** would reduce criteria pollutant impacts; however, impacts would remain significant.

Cumulative Impact 3.2-5: Trains, airplanes, ships and stationary and area sources substantially contribute to emissions in the region; these sources are addressed by the applicable AQMPs and not substantially affected by the Plan. All such emissions are anticipated to be consistent with applicable AQMPs and SIPs and within regional conformity emission budgets. Therefore, the Plan would result in a less-than-significant impact related to cumulatively considerable emissions.

The regional cumulative analysis assesses the impacts potential indirect effects in conjunction with other plans, programs, projects and policies that affect ambient air quality. Projected long-term emissions are considered to be cumulatively significant if they are not consistent with the local air quality management plans and state implementation plans. Consistency is demonstrated through the conformity analysis.

Regional emissions conformity is achieved if the projected emission inventories are within the budget emissions for each air basin for each milestone year (or if no budgets have been established by the interim build/no build or less than base year tests). In addition to the regional emissions analysis, conformity must show: 1) that the implementation of the Transportation Control Measures (TCM) contained in the SIPs are on schedule; 2) that the Financial Constraint Determination has been adequately prepared; and 3) that the required Interagency Consultation and Public Involvement has been adequately implemented.

The emissions budgets reflected in the AQMPs/SIPs function as the applicable emission budgets for the ozone conformity analysis for all non-attainment areas in the SCAG region. The conformity determinations based on the emission budgets for each air basin in the SCAG region, and conducted as part of the Plan development process, provide reasonable analysis of cumulative air quality impacts of the Plan. The 2012-2035 RTP/SCS should conform to the emissions budgets established in each applicable AQMPs/SIPs. Federal conformity regulations require emissions to be based on the Latest Planning Assumptions that include the latest vehicle data (fleet, age, activity) and latest socio-economic data. A conformity determination must be made for each nonattainment area in the region.

A regional analysis estimates the emissions from the implementation of the Plan and compares them to the emission budgets identified in the AQMPs/SIPs. If the estimated emissions from the Plan are greater than the emissions budget then the plan would not conform. In the absence of an emission budget, an interim test, such as the build/no build test is applied. In order to pass the build/no-build test, it must be demonstrated that emissions in the build scenario are less than or equal to the no-build scenario depending upon the non-attainment designation.

The applicable emissions budgets in the SCAG region are established by air basin, by air district, by pollutant and by years of analysis (milestone, attainment, and planning horizon years). The Transportation Conformity analysis is prepared separately from this PEIR and can be found in Appendices of the 2012-2035 RTP/SCS. The analysis concludes that the plan conforms to federal and state requirements for meeting attainment goals throughout the SCAG region.

Therefore, cumulative regional air quality impacts are considered to be less than significant with respect to consistency with applicable plans.

For purposes of comparison of on-road mobile emissions with other emission sources in the region, and to account for cumulative emissions from growth and other sources the following tables present estimated existing (the most recent year available is 2007) and 2035 emissions for the following emission sources in SCAB (which represent about 70 percent of emissions in the region): Trains (**Table 3.2-12**), Aircraft (**Table 3.2-13**), Ships and Commercial Boats (**Table 3.2-14**), Other Mobile Sources such as farm equipment, off-road vehicles, fuel handling, etc. (**Table 3.2-15**), and Stationary and Area Sources which includes all other emission sources including residential, commercial and industrial emissions and construction emissions, including 2012-2035 RTP/SCS projects (**Table 3.2-16**).

TABLE 3.2-12: FINAL 2007 AQMP FORECAST OF ANNUAL AVERAGE TRAIN EMISSIONS IN THE SCAB

	Tons/Day							
Year	TOG	VOC	CO	NO_x	SO_x	TSP	PM10	PM2.5
2008	2.97	2.48	7.06	28.95	0.14	0.86	0.85	0.78
2023	3.19	2.66	9.92	27.63	0.03	0.90	0.89	0.82
2030	3.41	2.85	11.99	32.86	0.03	0.95	0.95	0.87
2035 /a/	3.58	2.99	13.73	37.19	0.03	0.99	1.00	0.91

/a/ Calculated based on the annualized rate of change observed between 2023 and 2030.
SOURCE: SCAQMD, *2007 Air Quality Management Plan*, 2007.

TABLE 3.2-13: FINAL 2007 AQMP FORECAST OF ANNUAL AVERAGE AIRCRAFT EMISSIONS IN THE SCAB

	Tons/Day							
Year	TOG	VOC	CO	NO_x	SO_x	TSP	PM10	PM2.5
2008	9.07	8.10	58.31	17.42	1.68	0.97	0.91	0.89
2023	14.64	13.08	85.14	29.34	2.69	1.28	1.19	1.17
2030	17.63	15.75	98.23	35.67	3.21	1.42	1.33	1.30
2035 /a/	20.13	17.98	108.80	41.01	3.64	1.53	1.44	1.40

/a/ Calculated based on the annualized rate of change observed between 2023 and 2030.
SOURCE: SCAQMD, *2007 Air Quality Management Plan*, 2007.

TABLE 3.2-14: FINAL 2007 AQMP FORECAST OF ANNUAL AVERAGE SHIP AND COMMERCIAL BOAT EMISSIONS IN THE SCAB

	Tons/Day							
Year	TOG	VOC	CO	NO_x	SO_x	TSP	PM10	PM2.5
2008	4.31	3.61	10.35	76.95	20.10	4.18	4.05	3.90
2023	4.92	4.13	14.57	116.19	33.05	5.94	5.72	5.55
2030	6.13	5.13	17.69	152.49	48.64	8.31	8.00	7.77
2035 /a/	7.17	5.99	20.32	185.17	64.10	10.56	10.17	9.88

/a/ Calculated based on the annualized rate of change observed between 2023 and 2030.
SOURCE: SCAQMD, *2007 Air Quality Management Plan*, 2007.

TABLE 3.2-15: FINAL 2007 AQMP FORECAST OF ANNUAL AVERAGE OTHER MOBILE SOURCES (NOT INCLUDING AIRCRAFT, RAIL & SHIP) EMISSIONS IN THE SCAB

	Tons/Day							
Year	TOG	VOC	CO	NO_x	SO_x	TSP	PM10	PM2.5
2008	150.97	138.37	904.94	208.24	0.25	15.39	14.90	12.99
2023	108.10	100.46	4,009.67	94.74	0.33	11.18	10.33	8.23
2030	118.11	110.04	1,108.64	82.51	0.39	13.62	12.39	9.61
2035 /a/	125.82	117.44	1,185.22	74.75	0.44	15.68	14.11	10.74

/a/ Calculated based on the annualized rate of change observed between 2023 and 2030.
SOURCE: SCAQMD, *2007 Air Quality Management Plan*, 2007.

TABLE 3.2-16: FINAL 2007 AQMP FORECAST OF ANNUAL AVERAGE STATIONARY & AREA SOURCE EMISSIONS IN THE SCAB

	Tons/Day							
Year	TOG	VOC	CO	NO_x	SO_x	TSP	PM10	PM2.5
2008	476.84	245.08	177.40	86.80	16.60	447.24	231.87	65.19
2023	504.10	276.23	186.06	74.38	16.54	513.00	265.99	73.39
2030	527.34	291.47	192.01	75.99	16.78	544.12	282.21	77.42
2035 /a/	544.59	302.87	196.38	77.16	16.95	567.50	294.40	80.43

/a/ Calculated based on the annualized rate of change observed between 2023 and 2030.
SOURCE: SCAQMD, *2007 Air Quality Management Plan*, 2007.

Since no forecast for 2035 is currently available for these emissions, the annualized growth rate between 2023 and 2030 was used to project inventory estimates in 2035. It should be noted that this forecast is approximate, as it does not separately account for the effects of fleet turnover, growth and projected controls.

The AQMP is in the process of being updated and the emissions estimations have not been revised at the time of this analysis. The ARB prepared the *8-Hour Ozone State Implementation Plan Revisions and Technical Revisions to the PM2.5 State Implementation Plan Transportation Conformity Budgets for the South Coast and San Joaquin Valley Air Basins*[26] that was recently approved by the EPA. This document provides a recent estimation 2023 ROG and NO_X emissions for the SCAB. The ROG and NO_X emissions are within one and eight percent, respectively, of the emissions presented in the 2008 AQMP.

[26] ARB, *Proposed 8-Hour Ozone State Implementation Plan Revisions and Technical Revisions to the PM2.5 State Implementation Plan Transportation Conformity Budgets for the South Coast and San Joaquin Valley Air Basins*, June 20, 2011.

MITIGATION MEASURES[27]

Mitigation Measure **MM-AQ1** facilitates implementation of Transportation Control Measures in the Plan. Mitigation Measures **MM-AQ1** through **MM-AQ20** can and should be implemented by project sponsors (for both development and transportation projects) as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions.

MM-AQ1: Transportation Control Measures (TCMs) shall be implemented as appropriate by SCAG and can and should be implemented by local agencies and project sponsors as appropriate. TCMs included in the Plan are identified in the Transportation Conformity Appendix to the 2012-2035 RTP/SCS (starting on page 26). CAA Section 108(f)(1)(A) lists the following sixteen measures as illustrative of TCMs:

I. Programs for improved use of public transit;
II. Restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high occupancy vehicles;
III. Employer-based transportation management plans, including incentives;
IV. Trip-reduction ordinances;
V. Traffic flow improvement programs that achieve emission reductions;
VI. Fringe and transportation corridor parking facilities, serving multiple occupancy vehicle programs or transit service;
VII. Programs to limit or restrict vehicle use in downtown areas or other areas of emission concentration, particularly during periods of peak use;
VIII. Programs for the provision of all forms of high-occupancy, shared-ride services, such as the pooled use of vans;
IX. Programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place;
X. Programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas;
XI. Programs to control extended idling of vehicles;
XII. Programs to reduce motor vehicle emissions, consistent with Title II of the CAA, which are caused by extreme cold start conditions;
XIII. Employer-sponsored programs to permit flexible work schedules;
XIV. Programs and ordinances to facilitate non-automobile travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of transportation planning and development efforts of a locality, including programs and ordinances applicable to new shopping centers, special events, and other centers of vehicle activity;
XV. Programs for new construction and major reconstruction of paths, tracks or areas solely for the use by pedestrian or other non-motorized means of transportation, when economically feasible and in the public interest; and
XVI. Programs to encourage the voluntary removal from use and the marketplace of pre-1980 model year light duty vehicles and pre-1980 model light duty trucks.

The Plan has been prepared to facilitate implementation of TCMs that also serve as air quality mitigation measures for the purposes of the PEIR.

[27]Measures included here will also have the effect of reducing adverse impacts to environmental justice communities and have been adopted in the mitigation framework in the Environmental Justice Appendix.

MM-AQ2: Local air districts, local jurisdictions and project sponsors can and should implement measures adopted by ARB designed to attain federal air quality standards for PM2.5 and 8-hour ozone. ARB's strategy, includes the following elements:

- Set technology forcing new engine standards;
- Reduce emissions from the in-use fleet;
- Require clean fuels, and reduce petroleum dependency;
- Work with US EPA to reduce emissions from federal and state sources; and
- Pursue long-term advanced technology measures.
- Proposed new transportation–related SIP measures include:[28]

ON-ROAD SOURCES

- ✓ Improvements and Enhancements to California's Smog Check Program
- ✓ Expanded Passenger Vehicle Retirement
- ✓ Modifications to Reformulated Gasoline Program
- ✓ Cleaner In-Use Heavy-Duty Trucks
- ✓ Ship Auxiliary Engine Cold Ironing and Other Clean Technology
- ✓ Cleaner Ship Main Engines and Fuel
- ✓ Port Truck Modernization
- ✓ Accelerated Introduction of Cleaner Line-Haul Locomotives
- ✓ Clean Up Existing Commercial Harbor Craft

OFF-ROAD SOURCES

- ✓ Cleaner Construction and Other Equipment
- ✓ Cleaner In-Use Off-Road Equipment
- ✓ Agricultural Equipment Fleet Modernization
- ✓ New Emission Standards for Recreational Boats
- ✓ Off-Road Recreational Vehicle Expanded Emission Standards

MM-AQ3: Project sponsors can and should ensure that water or "toxic free" dust suppressants are applied to exposed earth surfaces to control emissions as necessary to control dust and comply with applicable regulations.

MM-AQ4: Project sponsors can and should ensure that all excavating and grading activities should cease during second stage smog alerts and periods of high winds.

MM-AQ5: Project sponsors can and should ensure that all trucks hauling dirt, sand, soil, or other loose materials off-site should be covered or wetted or should maintain at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer).

MM-AQ6: Project sponsors can and should ensure that all construction roads that have high traffic volumes, should be surfaced with base material or decomposed granite, or should be paved or otherwise be stabilized.

MM-AQ7: Project sponsors can and should ensure that public streets should be cleaned, swept or scraped at frequent intervals or at least three times a week if visible soil material has been carried onto adjacent public roads.

[28] ARB. April 26, 2007. *Proposed New SIP Measures – Descriptions. http://www.arb.ca.gov/planning/sip/2007sip/apr07draft/sipmeas.pdf*, accessed December 2011.

MM-AQ8: Project sponsors can and should ensure that construction equipment should be visually inspected prior to leaving the site and loose dirt should be washed off with wheel washers as necessary.

MM-AQ9: Project sponsors can and should ensure that water, hydroseed, or non-toxic soil stabilizers are applied to inactive construction areas as needed to reduce off-site transport of fugitive dust.

MM-AQ10: Project sponsors can and should ensure that traffic speeds on all unpaved surfaces should not exceed 25 mph.

MM-AQ11: Project sponsors can and should ensure that low sulfur or other alternative fuels or diesel powered vehicles with Tier 3 or better engines or retrofitted/repowered –to meet equivalent emissions standards as Tier 3 engines -should be used in construction equipment where feasible.

MM-AQ12: Project sponsors can and should ensure that deliveries related to construction activities that affect traffic flow should be scheduled during off-peak hours (e.g., 10:00 a.m. and 3:00 p.m.) and coordinated to achieve consolidated truck trips. When the movement of construction materials and/or equipment impacts traffic flow, temporary traffic control should be provided to improve traffic flow (e.g., flag person).

MM-AQ13: Project sponsors can and should ensure that to the extent possible, construction activity should utilize electricity from power poles rather than temporary diesel power generators and/or gasoline power generators.

MM-AQ14: Local jurisdictions or agencies can and should, as practical and feasible, revegetate exposed earth surfaces following construction. Application of xeriscape principles, including such techniques and materials as native or low water use plants and low precipitation sprinklers heads, bubblers, drip irrigation systems and timing devices, should also be considered.

MM-AQ15: Local jurisdictions can and should set specific limits on idling time for commercial vehicles, including delivery and construction vehicles.

MM-AQ16: Project sponsors can and should ensure that sandbags or other erosion control measures are installed to prevent silt runoff to public roadways as needed.

MM-AQ17: Project sponsors can and should designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties should include holidays and weekend periods when work may not be in progress. The name and telephone number of such persons should be provided to the local air district prior to the start of construction as well as posted on-site over the duration of construction.

MM-AQ18: Project sponsors can and should ensure that appropriate wind-breaks are installed at the construction site to minimize windblown dust.

MM-AQ19: In order to comply with the California Air Resources Board Air Quality and Land Use Handbook (June 2005) and achieve an acceptable interior air quality level for sensitive receptors, project sponsors can and should identify appropriate measures, to be incorporated into project building design for residential, school and other sensitive uses located within 500 feet of freeways, heavily travelled arterials, railways and other sources of Diesel particulate Matter and other known carcinogens. The appropriate measures should include one or more of the following methods as may be appropriate:

a. The project sponsor should retain a qualified air quality consultant to prepare a health risk assessment (HRA) in accordance with the California Air Resources Board and the Office of Environmental Health and Hazard Assessment requirements to determine the exposure of project residents/occupants/users to stationary air quality polluters prior to issuance of a demolition, grading, or building permit. The HRA should be submitted to the Lead Agency for review and approval. The sponsor should implement the approved HRA recommendations, if any. If the HRA concludes that the air quality risks from nearby sources are at or below acceptable levels, then additional measures are not required.
b. The project sponsor should implement the following features that have been found to reduce the air quality risk to sensitive receptors and should be included in the project construction plans. These should be submitted to the appropriate agency for review and approval prior to the issuance of a demolition, grading, or building permit and ongoing.
   i. Do not locate sensitive receptors near distribution center's entry and exit points.
   ii. Do not locate sensitive receptors in the same building as a perchloroleythene dry cleaning facility.
   iii. Maintain a 50 foot buffer from a typical gas dispensing facility (under 3.6 million gallons of gas per year).
   iv. 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. Either HEPA filters or ASHRAE 85% supply filters should be used.
   v. Retain a qualified HV consultant or HERS 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.
   vi. Maintain positive pressure within the building.
   vii. Achieve a performance standard of at least one air exchange per hour of fresh outside filtered air.
   viii. Achieve a performance standard of at least 4 air exchanges per hour of recirculation
   ix. Achieve a performance standard of .25 air exchanges per hour of in unfiltered infiltration if the building is not positively pressurized.
c. Project sponsor should maintain, repair and/or replace HV system or prepare an Operation and Maintenance Manual for the HV system and the filter. The manual should include the operating instructions and maintenance and replacement schedule. This manual should be included in the CC&R's for residential projects and distributed to the building maintenance staff. In addition, the sponsor should prepare a separate Homeowners Manual. The manual should contain the operating instructions and maintenance and replacement schedule for the HV system and the filters. It should also include a disclosure to the buyers of the air quality analysis findings.

MM-AQ20: To the maximum extent practicable the Lead Agency can and should ensure that private (individual and common) exterior open space, including playgrounds, patios, and decks, should either be shielded from stationary sources of air pollution by buildings or otherwise buffered to further reduce air pollution exposure for project occupants.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Criteria Pollutant Emissions

Even with implementation Mitigation Measures **MM-AQ1** through **MM-AQ18**, regional emissions of PM10 would increase in Imperial, Orange, and Riverside Counties. Therefore, the Plan would have a significant impact on regional air quality. It must be noted, however, that the SIPs for the region account for the increased fugitive dust (as well as tail pipe emissions) such that the 2012-2035 RTP/SCS conforms to the attainment demonstrations as required by the federal CAA.

Change in Risk Levels Adjacent to Freeways

Impacts related to health incidences were determined to be less than significant because of the decrease in risk at any given distance from freeways (due to emission controls).

Increased Population

Increasing population adjacent to transportation facilities could expose more people to increased cancer and other health risks. Even though cancer and other health risks adjacent to freeways and railroads would decrease considerably as compared to existing conditions, risk levels would remain above average for the region. Mitigation Measure **MM-AQ19** would reduce this impact to a level of less than significance. Mitigation Measure **MM-AQ20** would also reduce impacts associated with stationary sources of pollutants.

Construction Emissions

Even with implementation of Mitigation Measures **MM-AQ1** through **MM-AQ18**, activities related to construction of Plan projects would result in emissions exceeding thresholds for NO_X, CO, PM10, PM2.5, SO_2 and ROG. Therefore, construction of Plan projects and development would have a significant impact on regional air quality.

Cumulative Effects

Impacts related to cumulatively considerable emissions were determined to be less than significant without mitigation. Trains, airplanes, ships and stationary and area sources substantially contribute to emissions in the region; these sources are addressed by the applicable AQMPs and not substantially affected by the Plan. All such emissions are anticipated to be consistent with applicable AQMPs and SIPs and within regional conformity emission budgets. Therefore, the Plan would result in a less-than-significant impact related to cumulatively considerable emissions.

COMPARISION WITH THE NO PROJECT ALTERNATIVE

Direct Impacts

Criteria Pollutant Emissions. **Table 3.2-17** compares the existing conditions to the No Project Alternative criteria pollutant emissions by county. The No Project Alternative would result in more emissions than the Plan. **The Plan impacts would be less than the No Project impacts for Impact 3.10-1.**

Tables 3.2-4 and **3.2-5** show the residential and workplace cancer risk, respectively. The maximum residential and workplace risks due to vehicle operation on all freeway segments are much higher under existing (2012) conditions than under the No Project Alternative. The declines in cancer risk across all freeway segments are the result of continued decreases in per-vehicle mile fleet emissions projected to occur

due to continued emission control technology improvements in new vehicles. When compared to the Plan, the No Project Alternative would result in a higher risk in all counties expect for Orange and Imperial Counties. Regardless, the total regional risk would be lower under the Plan than the No Project Alternative. In addition, it is estimated that the Plan would result in 293,633 annual health incidences leading to $4,952,996,222 spent on healthcare. This is a 24 percent reduction when compared to the No Project Alternative. **The Plan impacts would be less than the No Project impacts for Impact 3.10-2.**

Construction Emissions. Under the No Project Alternative, no new transportation investments would be made, beyond those that are currently programmed. As a result, fewer transportation projects would be built resulting in less construction emissions from Plan projects. However, the same growth is anticipated under the No Project Alternative as under the Plan (although under the Plan it would be more concentrated around transit routes). **The Plan impacts would be greater than the No Project impacts for Impact 3.10-3 as a result of increased construction of Plan projects.**

Indirect Impacts

The Plan includes transportation and land use strategies that focus growth along existing corridors and in urbanized areas, rather than allowing development of vacant, open space/recreation and agricultural lands. This compact development pattern included in the Plan would concentrate population in urban areas and encourage alternative modes of travel other than automobiles. Without the planned development patterns, regional emissions would be higher than under the Plan. **The Plan impacts would be less than the No Project impacts for Impact 3.10-4.**

TABLE 3.2-17: CRITERIA POLLUTANT EMISSIONS BY COUNTY – EXISTING CONDITIONS (2012) VS NO PROJECT (2035)

County		Tons/Day								
		ROG Summer	ROG Annual	NO_x Summer	NO_x Annual	NO_x Winter	CO Winter	PM10 Annual	PM2.5 Annual	SO_x Annual
Los Angeles /a/	Existing	96	94	199	203	218	902	14	9	1
	No Project	44	42	72	73	77	328	14	9	2
	Difference	(52)	(50)	(127)	(30)	(141)	(574)	0	0	1
Imperial	Existing	5	4	14	13	14	34	1	1	0
	No Project	4	3	9	9	9	24	1	1	0
	Difference	(1)	(1)	(5)	(4)	(5)	(10)	0	0	0
Orange	Existing	31	30	52	53	58	280	4	3	0
	No Project	15	15	19	19	20	104	4	3	0
	Difference	(16)	(15)	(33)	(34)	(38)	(176)	0	0	0
Riverside /b/	Existing	26	23	76	76	80	227	5	4	0
	No Project	15	14	35	34	36	121	6	4	1
	Difference	(11)	(9)	(41)	(42)	(44)	(106)	1	0	1
San Bernardino /c/	Existing	28	25	81	81	85	251	5	4	0
	No Project	15	14	40	39	40	124	5	4	1
	Difference	(13)	(11)	(41)	(42)	(45)	(127)	0	0	1
Ventura	Existing	10	10	16	16	18	83	1	1	0
	No Project	4	4	5	5	6	29	1	1	0
	Difference	(6)	(6)	(11)	(11)	(12)	(54)	0	0	0

/a/ Los Angeles County excludes Antelope Valley
/b/ Riverside County includes the SCAB, MDAB and Coachella Valley portions
/c/ San Bernardino County includes the SCAB and MDAB portions
SOURCE: SCAG Transportation Modeling, 2011.

3.3 BIOLOGICAL RESOURCES AND OPEN SPACE

This section describes the current biological resources and open space in the SCAG region, discusses the potential impacts of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategies (2012-2035 RTP/SCS or Plan) on biological resources and open space, identifies mitigation measures for the impacts, and evaluates the residual impacts.

The SCAG region includes a rich assemblage of biological resources supported by a variety of elevation, landform, soil and rock types, and climate zones. This varied landscape contains a high diversity and abundance of species, including relatively recently-evolved species and localized habitats with species that occur only in Southern California. In addition, this section describes the existing ecosystems, sensitive species, and sensitive communities that occur in the SCAG region (shown on **Map 3.3-1** located in Chapter 8 (Maps)) and discusses current threats and protection efforts for these biological resources. Most of these biological resources exist within the open space of the SCAG region see **Map 3.3-2** located in Chapter 8 (Maps).

REGULATORY FRAMEWORK

Federal

Federal Endangered Species Act. The Endangered Species Act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Section 7 of the Endangered Species Act requires federal agencies to aid in the conservation of listed species, and to ensure that the activities of federal agencies will not jeopardize the continued existence of listed species or adversely modify designated critical habitat. At the federal level, the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) are responsible for administration of the Endangered Species Act.

Clean Water Act (CWA). At the federal level, the CWA (33 U.S.C. 1251) is the primary law regulating wetlands and waters. CWA regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (ACOE) with oversight by the Environmental Protection Agency (EPA).

Executive Order for Wetland Protection. The Executive Order for the Protection of Wetlands (E.O. 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency, such as the Federal Highway Administration, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

Migratory Bird Treaty Act (MBTA). The MBTA (16 U.S.C. Sections 703–711) includes provisions for the protection of migratory birds, including the non-permitted take of migratory birds, under the authority of the USFWS and the CDFG. The MBTA protects over 800 species, including geese, ducks, shorebirds, raptors, songbirds, and many common species.

Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA). The MPRSA, also known as the Ocean Dumping Act, prohibits the dumping of material into the ocean that would unreasonably degrade or endanger human health or the marine environment. Ocean dumping cannot occur unless a permit is issued under the MPRSA. In the case of dredged material, the decision to issue a permit is made by the U.S. Army Corps of Engineers, using EPA's environmental criteria and subject to EPA's concurrence.

State

California Endangered Species Act. The California Department of Fish and Game (CDFG) is responsible for the administration of the California Endangered Species Act. Unlike the federal Endangered Species Act, there are no State agency consultation procedures under the California Endangered Species Act. For projects that affect both a State and federal listed species, compliance with the federal Endangered Species Act will satisfy the California Endangered Species Act if the CDFG determines that the federal incidental take authorization is "consistent" with the California Endangered Species Act. Projects that result in a take of a State-only listed species require a take permit under the California Endangered Species Act. The federal and/or State acts also lend protection to species that are considered rare enough by the scientific community and trustee agencies to warrant special consideration, particularly with regard to protection of isolated populations, nesting or den locations, communal roosts, and other essential habitat.

California Fish and Game Code Sections 3500 through 3705, Migratory Bird Protection. Sections 3500 through 3705 of the California Fish and Game Code regulate the taking of migratory birds and their nests. These codes prohibit the taking of nesting birds, their nests, eggs, or any portion thereof during the nesting season. Typically, the breeding/nesting season is from March 1st through August 30th. Depending on each year's seasonal factors, the breeding season can start earlier and/or end later.

The Migratory Bird Treaty Act decrees that all migratory birds and their parts (including eggs, nests, and feathers) are fully protected. Under the act, taking, killing, or possessing migratory birds is unlawful. Projects that are likely to result in the taking of birds protected under the Migratory Bird Treaty Act will require the issuance of take permits from the USFWS. Activities that would require such a permit would include, but not be limited to, the destruction of migratory bird nesting habitat during the nesting season when eggs or young are likely to be present. Under the act, surveys are required to determine if nests will be disturbed and, if so, a buffer area with a specified radius around the nest would be established so that no disturbance or intrusion would be allowed until the young had fledged and left the nest. If not otherwise specified in the permit, the size of the buffer area would vary with species and local circumstances (e.g., presence of busy roads), and would be based on the professional judgment of the monitoring biologist.

California Coastal Act. Through the Coastal Act, the California Coastal Commission has unusually broad authority to regulate development in the Coastal Zone. A permit is required for any project that might change the intensity of land use in the Coastal Zone including projects that would require a building or grading permit from the city or county, major vegetation clearing, or subdividing. The coastal zone generally extends three miles seaward and about 1,000 yards inland. In particularly important and generally undeveloped areas where there can be considerable impact on the coastline from inland development, the coastal zone extends to a maximum of five miles inland from mean high tide line. In developed urban areas, the coastal zone extends substantially less than 1,000 yards inland.

State Agency Wetland Regulation. At the State level, wetlands and waters are regulated primarily by the CDFG and the Regional Water Quality Control Boards (RWQCBs). The RWQCBs were established under

the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of CWA. In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission) may also be involved. Sections 1600-1607 of the Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFG jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the ACOE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG.

Local

In addition to federal and State regulations, cities and counties in the SCAG region may also provide regulatory advisement regarding biological resources. Jurisdictions may incorporate policies related to biological resources into their General Plans or municipal codes. Examples of these types of local regulations include tree preservation ordinances.

EXISTING SETTING

Ecosystems in the SCAG Region

An ecosystem is the dynamic complex of plant and animal communities and their associated non-living environment. The exceptionally diverse plant and animal communities of the SCAG region call for a broad approach to their description. Habitat categories appropriate for this scale of diversity will be used here, generally following Barbour and Major's (1977) description of major vegetation types, as well as vegetation and habitat descriptions from Mayer and Laudenslayer (1988) and *California Wildlife: Conservation Challenges* from CDFG, 2007. Typical natural communities and species will be described for each ecosystem type, as well as representative and special status species. **Map 3.3-3**, located in Chapter 8 (Maps) shows the general location of natural vegetation types that represent the variety of ecosystems within the SCAG region. **Map 3.3-4**, also found in Chapter 8 (Maps) shows the general location of National Wetland Inventory wetlands in the SCAG region. The following is a description of each of these ecosystems within the region.

Desert Shrub (Scrub) and Woodland

The vast interior of Southern California is primarily desert, divided into two major regions – the Colorado Desert Region and the Mojave Desert Region. Both regions encompass a diversity of habitats and wildlife species.

Colorado Desert Scrub Vegetation. The Colorado Desert extends from southern San Bernardino and eastern Riverside Counties to Imperial County and ending at the Mexican border. It encompasses approximately 7 million acres and is part of the larger Sonoran Desert that extends into Arizona. The region is bordered by the Peninsular mountain range in the west and the Colorado River in the east. The majority of the region lies at a relatively low elevation, below 1,000 feet, with the lowest point found in the Salton Trough at 275 feet below sea level. The Colorado Desert experiences two rainy seasons per year (winter and late summer) and infrequent winter frosts. Creosote bush scrub habitat characterizes much of the Colorado Desert along with alkali desert scrub, desert succulent scrub, and desert wash vegetation. Species found in the region include creosote bush (*Larrea tridentata*), ocotillo (*Fouquieria splendens*), cholla (*Opuntia* spp.), *yucca* spp., desert agave (*Agave deserti*), mesquite (*Prosopis* spp.), catclaw acacia (*Acacia* gregii), and shrubby saltbushes (*Atriplex* spp.). Rare plants found in the region include Orcutt's woody aster (*Xylorhiza*

orcutti), Orocopia sage (*Salvia graetae*), Coachella Valley milk vetch (*Astragalus lentiginosus coachellae*), and crown of thorns (*Euphorbia milii*). Desert fan palm oases are rare ecological communities found only in the Colorado Desert. These oases attract large numbers of birds entering California from the southeast. Especially important oases in the SCAG region include Palm Springs, Cottonwood Spring, and Thousand Palms Oasis in Riverside County and Morongo Valley, and Twenty-nine Palms, Box "S" Spring, Old Woman Spring, and Saratoga Springs in San Bernardino County. These oasis habitats attract breeding populations of several species that are not commonly found west of central Arizona, including vermilion flycatchers (*Pyrocephalus rubinus*), brown-crested flycatchers (*Myiarchus tyrannulus*), Lucy's warblers (*Vermivora lucida*), and summer tanagers (*Pyranga rubra*).

Resident birds of the Colorado Desert region include Gambel's quail (*Callipepla gambeli*), black-throated sparrows (*Amphispiza bilineata*), Abert's towhees (*Pipilo aberti*), cactus wrens (*Campylorhynchus brunneicapillus*), Crissal thrashers (*Toxostoma dorsale*), phainopeplas (*Phainopepla nitens*), white-winged doves (*Zenaida asiatica*), and roadrunners (*Geococcyx californianus*).

Aside from a few species of toads along the Colorado River, amphibians are rare or absent from the deserts in the SCAG region. In contrast, a diverse array of reptiles occur in these desert habitats. Typical species include desert night lizards *(Xantusia vigilis*), chuckwallas (*Sauromalus obesus*), desert iguanas (*Dipsosaurus draconoides*), zebra-tailed lizards (*Uma* spp.), leopard lizards (*Gambelia wislizenii*), collared lizards (*Crotaphytus collaris*), sidewinders (*Crotalus cerastes*), Mojave rattlesnakes (*C. scutulatus*), and western diamondback rattlesnakes (*C. atrox*). Other common desert vertebrates include mule deer (*Odocoileus Hemionus*), bobcat (*Lynx rufus*), desert kangaroo rat (*Dipodomys deserti*), and black-tailed jackrabbit (*Lepus californicus*).

Some special status vertebrates found in desert scrub habitat include the desert tortoise (*Gopherus agassizii*), Bell's sage sparrow (*Amphispiza belli*), silvery legless lizard (*Anniella pulchra pulchra*), Palm Springs round-tailed ground squirrel (*Spermophilus tereticaudus chlorus*), and Peninsular bighorn sheep (*Ovis Canadensis nelsoni dps*). The desert slender salamander (*Batrachoseps major aridus*), Palm Springs pocket mouse (*Perognathus longimembris bangsi*), Coachella valley fringe-toed lizard (*Uma inornata*), and Sandstone night lizard (*Xantusia gracilis*) are special status species endemic to the Colorado Desert Region.

There are 15 invertebrate taxa found in the Colorado Desert Region that are special status species, 8 of which are endemic to the region.

Mojave Desert Scrub Vegetation. The Mojave Desert covers much of San Bernardino County and extends west into northern Los Angeles County and south into portions of northern Riverside County. It lies in the rain shadow of the southern Sierra Nevada and Southern California's Transverse and Peninsular Ranges, is generally higher in elevation than other regional deserts, and experiences regular winter frosts and occasional snows. Much of the Mojave Desert vegetation and wildlife is similar to that of the Colorado Desert. Creosote bush scrub and a variety of saltbush vegetation primarily dominate the Mojave Desert. Other common habitats include desert wash, alkali scrub, and Joshua tree scrub. Joshua trees (Yucca brevifolia) cover large areas of the Mojave Desert and are a dominant species of Joshua Tree National Monument east of the San Bernardino Mountain range. Some plants commonly found in Joshua Tree habitat include Mojave yucca (Y. schidegera), Nevada ephedra (Ephedra nevadensis), California buckwheat (Eriogonum fasciculatum ssp.), Cooper goldenbush (Ericameria cooperi), big galleta (Pleuraphis rigida), and desert needlegrass (Achnatherum speciosum). Rare plant species endemic to this region include ash-gray Indian paint brush (Castilleja cinerea), Parish's daisy (Erigeron parishii), Cushenbury milk-vetch (Astralagus albens), and Cushenbury buckwheat (Eriogonum ovalifolium var. vineum).

In pure stands, Mojave scrub habitat produces large numbers of seeds that provide large numbers of small mammals with their primary food source. These mammals include ground squirrels (*Spermophilus* spp. and *Ammospermophilus* spp.), kangaroo rats (*Dipodomys* spp.), deer mice (*Peromyscus* spp.), wood rats

(*Neotoma lepida*) and kangaroo mice (*Microdipidops* spp.). Desert oases used by migrating birds can also be found in this region. Conspicuous birds include common ravens (*Corvus corax*), prairie falcons (*Falco mexicanus*), American kestrels (*Falco sparverius*), barn owls (*Tyto alba*), quail, and mourning doves (*Zenaida macroura*).

Some special status invertebrates endemic to the Mojave desert include Inyo California towhee (*Pipilo crissalis eremophilus*), Amargosa vole (*Microtus californicus scirpensis*), Mojave tui chub (*Gila bicolor mohavensis*), Panamint kangaroo rat (*Dipodomys panamintinus panamintinus*), Saratoga springs pupfish (*Cyprinodon nevadensis nevadensis*), black toad (*Bufo exsul*), and Eagle Mountain scrub jay (*Aphelocoma californica cana*).

Beach and Dune (Coastal and Interior)

Beach and dune environments are relatively uncommon along the California coast; beach and dune occupies less than one-fourth of the coastline.[1] Within the SCAG region, substantial beach and dune environments are found only near Ventura and Los Angeles. The largest remaining area is the El Segundo Dunes, just north of the Los Angeles Airport. Dune environments also occur in desert areas where wind causes sand accumulation. Like beach dunes, desert dunes are uncommon in the SCAG region. The largest and most spectacular desert dunes are at the Kelso Dunes, the Barchan Dunes near the Salton Sea, and the dunes near Thousand Palms.

Beach and dune vegetation is generally low in plant cover and species richness. Most plant species in this habitat are perennials, usually prostrate plants adapted to an unstable, shifting substrate. The farther from the beach itself (or, in the case of desert dunes, the farther from the sand-bearing prevailing winds), the more stable the dunes and their vegetation become. Typical vegetation series in beach dunes are the sand-verbena-beach bursage (*Abronia* spp. *Ambrosia chamissonis*) series and dune lupine-goldenbush (*Lupinus chamissonis-Isocoma menziesii*) series. In disturbed areas, the iceplant (*Carpobrotus* spp., *Mesembryanthemum* spp., and *Malephora crocea*) series may be found. In desert dunes, typical vegetation is the desert sand-verbena (*Abronia villosa*) series.

Although few vertebrate species are endemic to beach and dune habitats, there are a number of insects and other invertebrates found only in sand ecosystems. These species include the Globose dune beetle (*Coelus globosus*) and the El Segundo blue butterfly (*Euphilotes battoides allyni*) in the coastal dunes and Hardy's dune beetle (*Anomala hardyorum*) in the desert dunes. Coastal beaches protected from human disturbance provide seasonal nesting habitats for California least terns (*Sterna antillarum browni*) and western snowy plovers (*Charadrius alexandrius nivosus*).

Conifer Forests and Woodlands

The montane and subalpine vegetation in the SCAG region consists of conifer-dominated forests and woodland. These generally occur at elevations of 3,000 feet or more in the Transverse and Peninsular Ranges. At the lower elevations, Coulter pine forms an open woodland, with canyon live oak, black oak (*Quercus kelloggii*), ponderosa pine, and Jeffrey pine. At somewhat higher elevations, yellow (ponderosa and Jeffrey) pine forest dominate. Farther upslope, upper montane conifer forests are present, consisting of white fir and sugar pine, followed by mountain juniper (*Juniperus occidentalis* ssp. *australis*) woodland on open slopes and ridges, and lodgepole pine (*Pinus contorta*) forest on flats and gentle slopes. The highest elevation forests are dominated by limber pine. These forests are found at the highest elevations of the San Bernardino Mountains. The actual elevation range of each forest type is dependent on other site factors, such as precipitation, moisture-holding capability of the soil, slope, and aspect.

[1]Barbour, M. G., Todd Keeler-Wolf, Allan A. Schoenherr, (Eds.), *Terrestrial Vegetation of California*. University of California Press, Berkeley and Los Angeles, 2007.

There are no true alpine areas within the highest mountains of the Transverse Range; that is, no areas that are climatically unable to support high-elevation conifer species. However, there are some treeless areas of talus, meadow, and exfoliating rock. Alpine vegetation is found in the talus and scree of Mt. San Gorgonio. Such vegetation includes several species of sedge, rush, and various perennial herbs.

No State or federally listed species occur in the alpine barren and rock habitat. One special status plant species, Sierra podistera (*Podistera nevadensis*), is known from this habitat in the mountains of San Bernardino County, although it is currently believed to be extirpated there. A few special status wildlife species can be found in alpine barrens and rocky, talus slopes of the SCAG region including bighorn sheep (*Ovis canadensis*).

Conifer forests offer multi-layered vegetation that provides foraging, nesting, and roosting substrates for a diversity of wildlife species. Many species, including neotropical migrant bird species, use the bark, branches, and foliage of these forests, including Great horned owls (*Bubo virginiana*), hairy woodpeckers, pileated woodpeckers (*Drycopus pileatus*), olive-sided flycatchers (*Contopus borealis*), western wood pewees (*C. sordidulus*), Steller's jays (*Cyanocitta stelleri*), brown creepers (*Certhia americana*), white-breasted nuthatches (*Sitta carolinensis*), golden-crowned kinglets (*Regulus satrapa*), solitary vireos, yellow-rumped warblers, western tanagers, black-headed grosbeaks, and purple finches (*Carpodacus purpureus*). Black bears (*Ursus americanus*) and black-tailed deer (*Odocoileus hemionus)* also frequent these forests.

Special status plant species of coniferous forests and woodlands include the Peirson's spring beauty (*Claytonia lanceolata* var. *peirsonii*), Mexican flannelbush (*Fremontodendron mexicanum*), Tahquitz ivesia (*Ivesia callida*), San Bernardino Mountains bladderpod (*Lesquerella kingii* ssp. *bernardina*), Parish's checkerbloom (*Sidalcea hickmanii* ssp. *parishii*), Hidden Lake bluecurls (*Trichostema austromontanum* ssp. *compactum),* Munz's onion (*Allium munzii*), Bear Valley sandwort (*Arenaria ursina*), Cushenbury milk vetch (*Astragalus albens*), Parish's daisy (*Erigeron parishii*), Cushenbury buckwheat (*Eriogonum ovalifolium* var. *vineum*), and Cushenbury oxytheca (*Oxytheca parishii* var. *goodmaniana*).

Special status wildlife species associated with conifer forests of the SCAG region include southern rubber boas (*Charina (bottai) umbratica*), and white-eared pocket mice (*Perognathus alticolus alticolus*).

The Tecate cypress (*Cypressus forbesii*), is a fire-adapted conifer species found only on low fertility soils. This species grows in several stands in the SCAG region in the vicinity of Sierra Peak in Orange County. Tecate cypress forest is considered a special status natural community by the California Natural Diversity Database (CNDDB), and the Tecate cypress itself is a California Native Plant Society listed species.

Hardwood Forests and Woodlands

Oak-dominated woodlands and forests are found at low- to mid-elevations of the Transverse and Peninsular Ranges. Canyon live oak (*Quercus chrysolepis*) forms forests with Coulter pine (*Pinus coulteri*), bigcone-fir (*Pseudotsuga macrocarpa*), Douglas-fir (*P. menziesii*), and interior live oak (*Quercus wislizenii*) on the higher and inner slopes of the mountains, as well as forming riparian forests along seasonal streams. Coast live oak woodland forms on more coastal slopes, while Engelmann oak (*Q. engelmannii*) woodland and valley oak (*Q. lobata*) woodland grow on deeper alluvial slopes and valleys. California walnut (*Juglans californica*) is found associated with coast live oak, usually on north slopes, and in some places becomes the dominant species. Woodland consists of trees with an understory of grasses and herbs. Introduced grasses dominate the understory, although in some cases native bunchgrasses may be present.

The CDFG recognizes valley oak woodland, Engelmann oak woodland, and California walnut woodland as sensitive woodland communities in the SCAG region. These communities have shown a dramatic decline due to urban and agricultural development in this century. Hardwood upland forests are found on higher, moister sites than oak woodlands and are distinguished from woodlands by a higher tree density. Walnut

forests found on the south side of the San Gabriel Mountains to the Santa Ana Mountains, mainland cherry forest historically found in Los Angeles County, island cherry (*Prunus ilicifolia* ssp. *lyonii)* forest and island ironwood (*Lyonothamnus floribundus*) forest found on the Channel Islands are considered sensitive natural communities.

Hardwood woodlands and forests of the SCAG region are especially attractive to wildlife because they provide important forage and cover for a large number of ground, shrub, and tree nesting raptors. Woodpeckers excavate nest holes in live and dead oaks, and these cavities are subsequently used by other cavity-nesting species, such as American kestrels (*Falco sparverius*), western screech owls (*Otus kennecottii*), tree swallows (*Tachycineta bicolor)*, ash-throated flycatchers (*Myiarchus cinerascens*), white-breasted nuthatches, plain titmice, and western bluebirds (*Sialia mexicana*). Oak acorns provide an important food source for many species including scrub jays (*Aphelocoma coerulesens*), western gray squirrels, and black-tailed deer (*Odocoileus hemionus)*.

Oak foliage and bark attract insects that are important to the diet of birds such as white-breasted nuthatches, plain titmice, Bewick's wrens (*Thryomanes bewickii*), ruby-crowned kinglets *(Regulus calendula*), American robins (*Turdus migratorius*), solitary vireos (*Vireo solitarius*), Hutton's vireos (*V. huttoni*), warbling vireos (*V. gilvus*), orange-crowned warblers (*Vermivora celata*), Nashville warblers (*V. ruficapilla*), yellow-rumped warblers (*Dendroica coronata*), black-throated gray warblers (*D. nigrescens*), western tanagers (*Piranga ludoviciana*), black-headed grosbeaks, fox sparrows (*Passerella iliaca*), northern orioles (*Icterus galbula*), and house finches (*Carpodacus mexicanus*).

The grassland understories of oak woodlands offer foraging habitat and cover for Pacific treefrogs (*Pseudacris (=Hyla) regilla*), western fence lizards (*Sceloporus occidentalis*), California quail (*Callipepla californica*), northern flickers (*Colaptes aureus*), black-tailed hares (*Lepus californicus*), deer mice (*Peromyscus maniculatus*), gray fox, and black-tailed deer (*Odocoileus hemionus)*.

Hardwood woodland is habitat for several special status plant species, including Orcutt's brodiaea *(Brodiaea orcuttii*), Laguna Beach dudleya (*Dudleya stolonifera*), Mexican flannelbush (*Fremontodendron mexicanum*), heart-leaved pitcher sage *(Lepechinia cardiophylla*) and Nevin's barberry (*Berberis nevinii*). Hardwood upland forest is also habitat for the Ojai fritillary *(Fritillaria ojaiensis*).

Special status wildlife that frequent hardwood forests and woodlands of the SCAG region include San Diego mountain kingsnakes *(Lampropeltis zonata pulchra*), Cooper's hawks (*Accipiter cooperii)*, golden eagles (*Aquila chrysaetos*), western yellow-billed cuckoos (*Coccyzus americanus occidentalis*), long-eared owls (*Asio otus*), southwestern willow flycatchers (*Empidonax traillii extimus*), brown-crested flycatchers (*Myiarchus tyrannulus*), and Santa Catalina shrews (*Sorex inornatus willetti*).

Grasslands

Grasslands of the SCAG region historically occurred in the deep soils of the larger valleys and coastal plains. These were prime development areas and the native grasslands have been largely eliminated. The remaining grasslands tend to be found in steeper, more rocky or remote parts of the SCAG region. The following describes the vegetation and wildlife found in grassland areas, as well as the special status species found.

Introduced annual grasses dominate the grasslands in the SCAG region. In areas that are relatively undisturbed, a significant portion of the vegetation may consist of native perennial bunch grasses, including members of the genera needlegrass (*Nassella, Stipa),* melic *(Melica),* Junegrass *(Koeleria),* and muhly *(Muhlenbergia)*. The composition and structure of the grasslands in prehistoric times cannot be known with certainty, because so many non-native herbs and grasses have become dominant in the grasslands of today. The California annual grassland series is common in the lower elevation grasslands of the coastal areas. At higher elevations in the Transverse and Peninsular Ranges, perennial grasses are more abundant, including

the purple needlegrass (*Nassella (=Stipa) pulchra*), foothill needlegrass *(N. lepida*), and nodding needlegrass (*N. cernua*) series, as well as the one-sided bluegrass (*Poa secunda*) series. Valley needlegrass grassland is a special status community that occurs at scattered locations throughout the western part of the SCAG region.

Because grasslands have been greatly reduced in extent, remaining grasslands offer important habitat for raptors, such as golden eagles, northern harriers (*Circus cyaneus*), and black-shouldered kites (*Elanus caeruleus*). Turkey vultures (*Cathartes aura*), red-tailed hawks (*Buteo jamaicensis*), Say's phoebes (*Sayornis saya*), western kingbirds (*Tyrannis verticalis*), water pipits (*Anthus spinoletta*), horned larks (*Eremophila alpestris*), American crows (*Corvus brachyrhynchos*), lark sparrows (*Chondestes grammacus*), western meadowlarks (*Sturnella neglecta*), black-tailed hares (*Lepus californicus*), California ground squirrels *(Spermophilus beechyi*), and black-tailed deer (*Odocoileus hemionus)* are typical wildlife observed in grasslands.

Special status plant species that occur in specialized habitat within grasslands include Munz's onion (*Allium munzii*), San Diego ambrosia (*Ambrosia pumila*), Braunton's milk-vetch (*Astragalus brauntonii*), thread-leaved brodiaea (*Brodiaea filifolia*), Orcutt's brodiaea (*Brodiaea orcuttii*), many-stemmed dudleya (*Dudleya multicaulis*), Conejo dudleya (*Dudleya parva*), Conejo buckwheat (*Eriogonum crocatum*), Orcutt's linanthus *(Linanthus orcuttii*), and Lyon's pentachaeta (*Pentachaeta lyonii*). Most of these species also occur in communities other than grassland and are restricted to specific soil types, hydrologic regimes, elevation range, and geographic distribution.

A variety of special status wildlife species occur in grassland habitats of the SCAG region, including western spadefoot toads (*Spea hammondii*), Swainson's hawks (*Buteo swainsoni*), prairie falcons (*Falco mexicanus*), white-tailed kites (*Elanus leucurus*), golden eagles (*Aquila chrysaetos*), burrowing owls (*Athene cunicularia*), Los Angeles pocket mice *(Perognathus longimembris brevinasus*), Stephen's kangaroo rats (*Dipodomys stephensi*), and the Palos Verde blue (*Glaucopysche lygdamus palosverdesensis*) and Quino checkerspot (*Euphydryas editha quino*) butterflies.

Scrub (Shrub)

California Chaparral. Chaparral is a fire-adapted community of evergreen shrubs, often with small, thickened or leathery leaves. Chaparral is found at middle elevations in the foothills of the Transverse and Peninsular Ranges, often on steep or rocky sites. Deeper soils and lower elevations tend to support grasslands or sage scrub, while higher elevations with cooler temperatures and more rainfall tend to support woodlands.

One of the most common chaparral plant species is chamise (*Adenostoma fasciculatum*); other important shrubs include scrub oak (*Quercus berberidifolia*), manzanitas *(Arctostaphylos* spp.), and ceanothus *(Ceanothus* spp.) species. The chamise series, as well as a number of series in which chamise is co-dominant with bigberry manzanita (*A. glauca*), black sage (*Salvia mellifera*), cupleaf ceanothus (*Ceanothus greggii*), hoaryleaf ceanothus (*C. crassifolius*), white sage (*S. apiana*), and Eastwood manzanita (*A. glandulosa*), are common vegetation series found in chaparral within the SCAG region. The scrub oak series, red shank (*Adenostoma sparsifolium*) series, interior live oak (*Q. wislizenii*) series, and chaparral whitethorn (*C. leucodermis*) series are also common in chaparral. Although chaparral covers a large portion of the SCAG region, none of the chaparral community types are considered sensitive by the CDFG.

Chaparral provides dense cover for a variety of shrub-dependent wildlife species. The wrentit (*Chamaea fasciata*) is a bird found primarily in the chaparral belt of California. Other species often associated with chaparral habitats in the SCAG region include California quail, Anna's hummingbirds, bushtits, Bewick's wrens, northern mockingbirds (*Mimus polyglottos*), California thrashers (*Toxostoma redivivum*), orange-crowned warblers, rufous-sided towhees, California towhees, white-crowned sparrows (*Zonotrichia albicollis*), golden-crowned sparrows (*Z. atricapilla*), and lesser goldfinches (*Carduela psaltria*). Western

fence lizards, southern alligator lizards (*Gerrhonotus multicarinatus*), western rattlesnakes (*Crotalus viridis*), and black-tailed deer (*Odocoileus hemionus)* also frequent chaparral habitats. Chaparral provides habitat for several special status plant species that usually occur in openings among the shrubs and often on uncommon soils or parent materials. The endangered slender-horned spineflower (*Dodecahema leptoceras*) occurs in chaparral, as well as in coastal sage scrub. Other special status plant species occurring in chaparral include summer holly (*Comarostaphylos diversifolia* ssp. *diversifolia*), dune larkspur (*Delphinium parryi* ssp. *blochmaniae*), Santa Monica Mountains dudleya (*Dudleya cymosa* ssp. *ovatifolia*), San Gabriel Mountains dudleya (*D. densiflora*), Laguna Beach dudleya (*D. stolonifera*), Conejo buckwheat (*Eriogonum crocatum*), Mexican flannelbush (*Fremontodendron mexicanum*), Santa Susana tarplant (*Deinandra minthornii*), Nevin's barberry (*Berberis nevinii*), Lyon's pentachaeta (*Pentachaeta lyonii*), Parish's checkerbloom (*Sidalcea hickmanii* ssp. *parishii*), and crownbeard (*Verbesina dissita*). Few special status wildlife species exclusively require chaparral habitats. The CNDDB lists only the desert monkey grasshopper (*Psychomastix deserticola*) and the Santa Monica shieldback katydid (*Aglaothorax longipennis*) as sensitive species occurring in this habitat.

Southern Coastal Scrub. Coastal sage scrub is a drought-deciduous Mediterranean climate community characterized by soft-leaved, shallow-rooted shrubs. It once covered more than 4,000 square miles in Southern California. As a result of urban and agricultural development, more than 80 percent of this habitat has been eliminated and many of plants and wildlife associated with this community have experienced similar declines. Dominant species include California sagebrush (*Artemisia californica californica*), California buckwheat (*Eriogonum fasciculatum*), beavertail cactus (*Opuntia* spp.) and black sage (*Salvia mellifera*). The CNDDB lists three sensitive coastal scrub communities for the SCAG region: southern coastal bluff scrub at localized points along the coast, maritime succulent scrub which occurs on San Clemente and Catalina Islands, and riversidian alluvial fan sage scrub.

The San Diego horned lizard (Phrynosoma coronatum blainvillei), coastal western whiptail (*Aspidoscelis tigris stejnegeri*), orange-throated whiptail (*Aspidoscelis (=Cnemidophorus) hyperythra*), San Bernardino kangaroo rat (*Dipodomys merriami parvus*), northwestern San Diego pocket mouse (*Chaetodipus* (*=perognathus) fallax*), and California gnatcatcher (Polioptila californica) occur nearly exclusively in coastal sage scrub. The largest assemblage of special status wildlife species in the SCAG region is mapped within coastal sage scrub habitats. In addition to these dependent species, coastal sage scrub also provides habitat for a number of more widespread species that are adapted to chaparral and desert scrub habitats. Several special status plant species, such as the Santa Ana River woollystar (Eriastrum densifolium ssp. sanctorum), slender-horned spineflower (*Dodecahema leptoceras*), Munz's onion (*Allium munzii*), several dudleya species (*Dudleya* spp.), Santa Susana tarplant (*Deinandra minthornii*), and Nevin's barberry (*Berberis nevinii*), occur in coastal sage scrub.

Wetlands

Generally, wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Wetlands vary widely because of regional and local differences in soils, topography, climate, hydrology, water chemistry, vegetation, and other factors, including human disturbance. Wetlands include riparian areas, inland waters, and marine and estuarine environments. Each supports a diverse array of biological communities, described below. **Map 3.3-4**, located in Chapter 8 (Maps), displays the wetlands in the SCAG region identified in the National Wetlands Inventory. **Table 3.3-1** provides information on the larger natural wetlands in the SCAG region. This chapter focuses on the habitats and species that occur in these water bodies. Section 3.13 Water Resources, of this PEIR discusses the characteristics of these surface waters.

TABLE 3.3-1: NATURAL WETLANDS IN THE SCAG REGION

Wetland	Counties Where Located	Protected and Enhanced Area Size, if any	# of Known Special Status Species
Aliso Creek Wetlands	OR, RIV, SBD	1 acre protected, 3 acres enhanced	unknown
Anaheim Bay	OR	956 acres enhanced	12
Bolsa Chica Wetlands	OR	880 acres protected	12
Ballona Lagoon	LA	16.3 acres enhanced	4
Ballona Creek Wetlands	LA	192 acres protected	9
BSA	SBD	118 acres protected	unknown
Calvary Chapel	SBD	100 acres protected	unknown
Colorado Desert District	SBD, IMP, RIV	146 acres enhanced	unknown
Colorado Lagoon	LA	14 acres protected	unknown
Deep Creek	SBD	300 acres protected	unknown
Emma Wood State Beach	VEN	5 acres enhanced	unknown
Hellman Ranch Wetlands	OR	27.1 acres protected	10
Henrietta Marsh	LA	5 acres enhanced	unknown
Hidden Valley Wildlife Area	RIV	70 acres enhanced	unknown
Huntington Beach Wetlands	OR	115 acres protected	10
Imperial Wildlife Area	IMP	325 acres enhanced	unknown
Klondike Canyon PV	LA	160 acres enhanced	unknown
Laguna Lakes	OR	30 acres restored; 3 acres enhanced	6
Lombardi	SBD	102 acres protected	unknown
Los Angeles River	LA	234 acres protected	3
Los Cerritos Wetlands	LA	129.5 acres protected	6
Malibu Lagoon	LA	92 acres protected	8
McGrath Lake	VEN	>10 acres protected	3
Mugu Lagoon	VEN	1,474 acres protected	33
Mystic Lake	RIV	175 acres protected	unknown
Ormond Beach Wetlands	VEN	217 acres protected	12
Picacho State Rec Area	IMP	20 acres enhanced	unknown
San Joaquin Marsh	OR	492 acres protected	15
San Juan Creek	OR	3 acres protected	1
Santa Ana River Mouth	OR	168 acres protected	17
San Jacinto Wildlife Area	RIV	360 acres enhanced	unknown
Santa Clara River Estuary	VEN	133 acres protected	8
Santa Margarita River/Lagoon	RIV, SDG	250 acres protected; 600 acres restored	20
Topanga Lagoon	LA	2.1 acres protected	0
Trancas Lagoon	LA	2 acres protected	0
Upper Newport Bay	OR	1,357 acres protected	6
Ventura River Estuary	VEN	110 acres enhanced	10

SOURCE: Southern California Wetlands Inventory, available at: http://ceres.ca.gov/wetlands/geo_info/so_cal/ so_cal_wetland_index.html, accessed August 11, 2011.

Vernal pools are a special example of interior wetlands. They are seasonal freshwater pools that form in depressions over an impermeable soil layer (claypan or hardpan) or parent material. Annual species with low cover and a short life cycle primarily comprise the vegetation in vernal pools. The vernal pools of the Santa Rosa Plateau are isolated from other areas of California in the Central Valley and San Diego County, and they support a distinctive flora with a number of endemic species. Special status invertebrates found in Riverside County vernal pools include the vernal pool fairy shrimp (*Branchinecta lynchi*) and the Riverside fairy shrimp (*Streptocephalus woottoni*).

Interior lakes that are especially important to wildlife in the SCAG region include Silverwood Lake, Lake Arrowhead, Big Bear Lake, and Baldwin Lake in the San Bernardino Mountains, and Lake Hemet in the San Jacinto Mountains. There are a number of lakes, including Lake Matthews, Lake Skinner, and the Prado

Basin in western Riverside County, which serve primarily as reservoirs of potable water, or for flood control, water conservation, or emergency storage, but which also support numerous species of wildlife. The open water, mudflats, and emergent vegetation associated with these aquatic habitats are of great importance to birds and other wildlife.

The Salton Sea in Imperial County is by far the largest aquatic habitat in the SCAG region and attracts water birds that are otherwise rare or entirely absent in Southern California. The lakeshore of the sea is largely barren, but extensive marshes exist at the mouths of the Whitewater River at the north end, the New and Alamo Rivers at the south end, and Salt Creek at the eastern shoreline. Finney and Ramer Lakes near the southeast corner of the Salton Sea also provide extensive wetland habitats that attract a variety of wildlife species.

Freshwater marshes are habitat for several special status species, including the endangered marsh sandwort (*Arenaria paludicola)* and Gambel's water cress (*Nasturtium gambelii)*. Localized alkali meadows with unusual soil or water characteristics are habitat for a number of special status plants, including slender-petaled thelypodium (*Thelypodium stenopetalum)*, silver-haired ivesia (*Ivesia argyrocoma)*, Baldwin Lake linanthus (*Linanthus killipii)*, and San Bernardino ragwort (*Packera bernardina)*. Plants associated with alkaline meadows in the desert areas include alkali mariposa lily (*Calochortus striatus)*, Tecopa bird's-beak (*Cordylanthus tecopensis)*, and Parish's alkali grass (*Puccinellia parishii*).

Special status wildlife associated with freshwater marshes of the SCAG region include California red-legged frogs (*Rana aurora draytonii*), southwestern pond turtles (*Actinemys (=Clemmys) marmorata pallida*), great blue herons (*Ardea herodias)*, great egrets (*A. alba*), and bald eagles (*Haliaeetus leucocephalus)*. Freshwater marshes along the Colorado River support the endangered Yuma clapper rail (*Rallus longirostris yumanensis)*.

Coastal Salt Marsh and Estuaries. Coastal wetlands include estuarine and salt marsh wetland communities subject to tidal influence. In the SCAG region, some of the largest estuaries and salt marshes are the Santa Clara River estuary and Mugu Lagoon in Ventura County, Malibu Lagoon and Ballona wetlands in Los Angeles County, and Seal Beach marshes, Bolsa Chica Lagoon, and Upper Newport Bay in Orange County.

Vegetation in coastal salt marsh is generally emergent herbaceous perennial species. The dominant plants all have features that allow them to live in saline soils and to absorb water despite its dissolved salts. Typical vegetation series in coastal salt marsh includes the cordgrass (*Spartina foliosa*) series, in the areas of deepest inundation, pickleweed (*Salicornia* spp.) series in areas flooded frequently but at less depth, and saltgrass series (*Distichlis spicata*) in marginally flooded areas that accumulate salts through evaporation.

Southern California's extensive mainland and island coastal areas include some of the richest habitats for marine birds and mammals in North America. The ocean waters, lagoons, beaches, bays, estuaries, saltwater marshes, and tidal flats provide habitat for an abundance of seabirds, shorebirds, wading birds, and waterfowl. Typical birds of rocky coasts include double-crested (*Phalacrorax auritus)* and pelagic cormorants (*P. pelagicus)*, black oystercatchers (*Haematopus bachmani)*, black turnstones *(Arenaria melanocephala)*, wandering tattlers (*Heteroscelus incanus)*, and surfbirds (*Aphriza virgata)*. Sandy beaches experience heavy human use, but undisturbed areas attract marbled godwits (*Limosa fedoa)*, sanderlings *(Calidris alba*), and special status species, such as western snowy plovers and California least terns.

Several special status plant species occur in southern coastal salt marshes, including the endangered salt marsh bird's-beak (*Cordylanthus maritimus* ssp. m*aritimus)*, recorded in eight locations in Ventura and Los Angeles Counties. Coastal salt marshes also support the endangered light-footed clapper rails (*Rallus longirostris levipes)* and Belding's savannah sparrows (*Passerculus sandwichensis beldingi)*.

Riparian Habitats

Riparian plant communities are tree or shrub-dominated communities that occur along streams and rivers. Historically, the most well-developed riparian vegetation occurred on the largest coastal streams, such as the Santa Clara, Los Angeles, Santa Ana, San Gabriel and Santa Margarita Rivers. Typical dominant species in the forests, woodlands, and scrubs along these rivers are Fremont cottonwood (*Populus fremontii*), California sycamore (*Platanus racemosa*), various species of willow *(Salix* spp.), coast live oak (*Quercus agrifolia*), canyon live oak (*Q. chrysolepis*) and white alder (*Alnus rhombifolia)*. Vegetation series represented in riparian vegetation of the SCAG region include Fremont cottonwood, arroyo willow (*S. lasiolepis)*, black willow (*S. gooddingii)*, Hooker willow (*S. hookeriana)*, red willow (*S. laevigata)*, and mixed willow, as well as coast live oak and canyon live oak series. The characteristics of the major coastal rivers in the SCAG region are provided in **Table 3.3-2**.

TABLE 3.3-2: CHARACTERISTICS OF MAJOR COASTAL RIVERS

River	Watershed Area (acres)	Natural Waterway Miles	% River in Protected Lands	# Stream Crossings	# Special Status Species	# Dams
Santa Barbara Coastal	240,720	633	1%	951	23	11
Santa Clara	1,032,302	2,624	21%	2,649	26	8
Los Angeles	534,420	801	0%	1,440	20	51
San Gabriel	453,960	828	19%	1,405	20	26
Santa Ana	1,082,540	2,033	3%	2,916	73	52
Santa Margarita	473,562	1,033	5%	1,488	45	9
San Luis Rey	495,650	961	2%	1,311	44	18

SOURCE: CARA – ICE, *Watershed Info*, available at: *http://endeavor.des.ucdavis.edu/newcara/*, accessed August 11, 2011.

Desert riparian vegetation occurs along permanent streams, intermittent streams, desert washes, permanent springs, and alkali sinks. Desert riparian vegetation includes Mojave riparian forests, Sonoran cottonwood-willow riparian forest, mesquite (*Prosopis glandulosa* and *P. pubescens)* bosque, desert dry wash woodland, and desert fan palm oasis woodland (mesquite series, fan palm series, arroyo willow, narrowleaf willow (*Salix exigua)*, and Fremont cottonwood series).

Where the riparian habitat has been degraded, either through alteration of the hydrology or direct disturbance to the vegetation, the non-native tamarisk (*Tamarix* spp.; in tamarisk series) is often dominant. Most remaining high-quality desert riparian vegetation is considered special status by the CDFG. Major desert riparian systems occur along the Amargosa, Mojave, and Colorado Rivers.

Riparian habitats support the densest and most diverse wildlife communities in Southern California. The diversity of plant species, multi-layered vegetation, and perennial water provides a variety of foods and microhabitat conditions for wildlife. Mature willows, oaks, sycamores, and other riparian trees provide high-quality nesting habitat for wildlife, such as raptors. Cavity-nesting wildlife, such as the Nuttall's woodpeckers (*Picoides nuttalli*), downy woodpeckers (*Picoides pubescens*), northern flickers (*Colaptes auratus*), plain titmice (*Parus inornatus*), white-breasted nuthatches (*Sitta carolinensis*), bats, and western gray squirrels (*Sciurus griseus*), require mature stands of trees. California grape (*Vitis californicus*) vines, blackberries (*Rubus* spp.), elderberries (*Sambucus* spp.), and oaks (*Quercus* spp.) produce important fall and winter foods for birds and mammals. Common wildlife species that depend on the nectar, fruits, and seeds of riparian plants include Anna's hummingbirds (*Calyptes anna*), black-headed grosbeaks (*Pheuticus melanocephalus*), rufous-sided towhees (*Pipilo erythrophthalamus*), California towhees (*Pipilo fuscus*), raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), and gray foxes (*Urocyon cinereoargenteus*).

Riparian vegetation supports an abundance of insect prey that feed on foliage and stems during the growing season. These insects, in turn, support a high density of migratory and resident birds, including the Pacific-

slope flycatchers (*Empidonax difficilis*), western wood pewees (*Contopus sordidulatus*), yellow warblers (*Dendroica petechia*), MacGillivray's warblers (*Oporomis tolmiei*), Wilson's warblers (*Wilsonia pusilla*), warbling vireos (*Vireo gilvus*), bushtits (*Psaltriparus minimus*), and house wrens (*Troglodytes aedon*).

Special status plant species of riparian habitats include Nevin's barberry (*Berberis nevinii*), Davidson's bush mallow (*Malacothamnus davidsonii*), triple-ribbed milkvetch (*Astragalus tricarinatus*), short-joint beavertail (*Opuntia basilaris* var. *brachyclada*) and Parish's gooseberry (*Ribes divaricatum* var. *parishii*).

Some birds typical of riparian habitats such as willow flycatchers (*Empidonax traillii*), least Bell's vireos (*Vireo bellii pusillus*), and yellow-billed cuckoos (*Coccyzus americanus occidentalis*) have been eliminated from most of their historical range in Southern California. Riparian habitats in the SCAG region support small populations of special status wildlife species such as least Bell's vireos (*Vireo bellii pusillus*), southwestern willow flycatchers (*Empidonax traillii extimus*), yellow warblers (*Dendroica petechia brewsteri*), arroyo toads (*Bufo californicus*) and southwestern pond turtles (*Actinemys (=Clemmys) marmorata pallida*).

The ephemeral and semiarid nature of the rivers of the SCAG region have not supported an abundance of native fish, and many native fish found in the SCAG region are currently of endangered or threatened status because of habitat loss and water quality degradation. Native fish commonly found in the rivers of the SCAG region are probably limited to the speckled dace (*Rhinichthys osculus)*, and the staghorn sculpins (*Leptocottus armatus)*. Less common are special status fish found in rivers of the SCAG region. These include the threespine unarmored stickleback (*Gasterosteus aculeatus*), the tidewater goby (*Eucyclogobius newberryi*), the Mohave tui chub (Gila bicolor mohavensis), bonytail (*Gila elegans*), the Colorado squawfish, (Ptychocheilus lucius), the desert pupfish (*Cyprinodon macularius*), the southern coastal population of steelhead (*Onchorynchus mykiss*), the razorback sucker (*Xyrauchen texanus*), and the Santa Ana sucker (*Catostomus santaanae*), all of which are on the Federal threatened/endangered species list.

Coastal Marine Resources

The coastal waters of Southern California are extremely rich in fisheries and other marine resources. Not only is the ecosystem diverse, with 144 families and over 500 species of fish reported, but it is also very productive. Fish families prominent in the SCAG coastal waters include 23 species of viviparous perch (*Embiotocidae*), more than 60 species of sea bass (*Sebastes*), about 60 species of sculpin (*Cottidae*), over 20 species of flounder (*Pleuronectidae*), five species of salmon (*Salmonidae*), various rockfish (*Scorpaenidae*), and other small bottom fish (*Stichaeidae*, *Blenniidae*, *Clinidae*). Coastal waters in Southern California also support a rich assemblage of sea mammals. Pinnepeds include the California sea lion (*Zalophus californicus*), the federally endangered Guadalupe fur seal (*Arctocephaus townsendi*), and the stellar sea lion (*Eumetopius jubatus*). Cetacan residents of Southern California coastal waters include at least 18 species of whales and dolphins, many of which are federally endangered. Prominent among those are the Gray whales (*Eschrichtius robustus*) that migrate through the area to coastal birthing and rearing lagoons in Baja California.

Kelp forest, rock-bottom, and shallow sand-bottom communities are the predominant near-shore habitats in Southern California. Several marine species of special status are dependent on kelp forests. These include the federally endangered brown pelican (*Pelecanus occidentalis*), gray whale (*Eschrichtius robustus*) and the sea otter (*Enhydra lutris*).

Farmland and Rangeland

Farmlands and rangelands are agricultural lands that are part of the region's open landscape and entail various types and degrees of modifications to natural lands. Farmlands include irrigated and non-irrigated crop production. Rangelands include any expanse of natural land that is not fertilized, irrigated, or cultivated and is predominately used for grazing by livestock and wildlife. Based on 2008-2010 estimates prepared by

the California Department of Conservation (CDC), there are approximately 2.6 million acres of agricultural lands in the SCAG region: approximately 1.1 million acres of farmland and 1.4 million acres of rangeland. This estimate is substantially higher that the estimate in the 2005 SCAG land use inventory because the latter includes substantial areas of rangeland under the "vacant" category. It also should be noted that the CDC estimate is based on a selective inventory of agricultural lands, and the SCAG inventory is based on aerial imagery interpretation. As indicated in **Table 3.3-3**, there is substantially more farmland than rangeland in Riverside and Imperial counties and the reverse in Los Angeles, Orange, and San Bernardino counties. Ventura County has similar amounts of farmland and rangeland.

TABLE 3.3-3: ESTIMATED FARMLANDS AND RANGELANDS IN THE SCAG REGION (2008-2010)

County	Ventura	Los Angeles	Orange	Riverside	San Bernardino	Imperial	SCAG Region
Total Land Acres	1,180,800	2,599,040	504,960	4,612,480	12,833,280	2,672,000	**24,402,560**
FARMLANDS AND RANGELANDS							
Farmland of Local Importance	16,218	6,855	0	229,157	1,829	32,109	**286,168**
Prime Farmland	43,790	30,876	3,243	122,936	14,089	195,589	**410,523**
Farmland of Statewide Importance	33,841	952	367	44,651	6,747	311,048	**397,606**
Unique Farmland	28,643	1,129	3,654	37,135	2,661	2,196	**75,418**
All Farmland	122,492	39,812	7,264	433,879	25,326	540,942	**1,169,715**
Grazing	195,674	231,475	37,639	111,221	901,666	0	**1,477,675**
Total	**318,166**	**271,287**	**44,903**	**545,100**	**926,992**	**540,942**	**2,647,390**

SOURCE: SCAG and TAHA, 2011.

Historically, development patterns in the region have been tied as much to the conversion of agricultural lands as to the consumption of natural lands for urban uses. A key issue in the region today is whether the high rate of farmland conversion in recent years can be slowed to prevent irreversible losses. An estimated 230,000 acres of farmland and grazing land were converted to non-agricultural uses and/or applied for development entitlements between 1996 and 2004. If this trend continues unabated, the existing inventory of agricultural lands could be reduced by approximately 660,000 acres before 2035.

Special Status Species and Natural Communities

A number of species known to occur in the SCAG region are accorded "special status" because of their recognized rarity or vulnerability to habitat loss or population decline. Federal and/or State endangered species listings provide specific protection for some of these species. To meet conservation objectives, State agencies, local jurisdictions, and other organizations apply designations, such as "rare" or "sensitive" to species that have been formally listed as threatened or endangered. These species are referred to collectively as "special status species." **Table 3.3-4**, below, lists by county, the scientific and common name and protection status for special status species found within the SCAG area. The list contains several hundred species—plants, fish, amphibians, reptiles, mammals, birds, mollusks, insects and crustaceans. Site-specific information on each of these species is maintained by the CNDDB, including the population size, habitat quality and extent, threats, and when last observed.

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
NON-VASCULAR PLANTS						
Graphis saxorum	Baja Rock Lichen	None	None			LA
VASCULAR PLANTS						
Achnatherum aridum	Mormon Needle Grass	None	None		2	SB
Acleisanthes logniflora	Angel Trumpets	None	None		2	RIV
Allium munzii	Munz's Onion	Endangered	Threatened		1B	RIV
Allium nevadense	Nevada Onion	None	None		2	SB
Ambrosia pumila	San Diego Ambrosia	Species of Concern	None		1B	RIV
Ammoselinum giganteum	Desert Sand Parsley	None	None		2	RIV
Androstephium breviflorum	Small-Flowered Androstephium	None	None		2	RIV, SB
Antennaria marginata	White-Margined Everlasting	None	None		2	SB
Antirrhinum cyathiferum	Deep Canyon Snapdragon	None	None		2	RIV
Aphanisma blitoides	Aphanisma	Species of Concern	None		1B	LA, OR, VEN
Arabis breweri var pecuniaria	San Bernardino Rock Cress	Species of Concern	None		1B	SB
Arabis dispar	Pinyon Rock Cress	None	None		2	RIV, SB
Arabis hoffmannii	Hoffman's Rock Cress	Endangered	None		1B	VEN
Arabis johnstonii	Johnston's Rock Cress	Species of Concern	None		1B	RIV
Arabis parishii	Parish's Rock Cress	Species of Concern	None		1B	SB
Arabis pulchra var munciensis	Darwin Rock Cress	None	None		2	RIV, SB
Arabis shockleyi	Shockley's Rock Cress	None	None		2	SB
Arctomecon merriamii	White Bear Poppy	Species of Concern	None		1B	SB
Arctostaphylos catalinae	South Catalina Island Manzanita	Species of Concern	None		1B	LA
Arctostaphylos gabrienlensis	San Gabriel Manzanita	Species of Concern	None		1B	LA
Arctostaphylos peninsularis ssp peninsularis	Peninsular Manzanita	None	None		2	RIV
Arctostaphylos rainbowensis	Rainbow Manzanita	None	None		1B	RIV
Arenaria paludicola	Marsh Sandwort	Endangered	Endangered		1B	RIV, SB
Arenaria ursina	Big Bear Valley Sandwort	Threatened	None		1B	SB
Argyrochosma limitanea var limitanea	Cloak Fern	None	None		2	SB
Astragalus albens	Cushenbury Milk-Vetch	Endangered	None		1B	SB
Astragalus allochrous var playanus	Playa Milk-Vetch	None	None		2	SB
Astragalus brauntonii	Braunton's Milk-Vetch	Endangered	None		1B	LA, OR, VEN
Astragalus cimae var cimae	Cima Milk-Vetch	None	None		1B	SB

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Astragalus insularis var harwoodii	Harwood's Milk Vetch	None	None		2	IMP, RIV
Astragalus jaegerianus	Lane Mountain Milk-Vetch	Endangered	None		1B	SB
Astragalus lentiginosus var antonius	San Antonio Milk-Vetch	Species of Concern	None		1B	LA, SB
Astragalus lentiginosus var cachellae	Coachella Valley Milk-Vetch	Endangered	None		1B	RIV
Astragalus lentiginosus var sierrae	Big Bear Valley Milk-Vetch	Species of Concern	None		1B	SB
Astrgalus leucolobus	Big Bear Valley Woollypod	Species of Concern	None		1B	LA, RIV, SB, VEN
Astragalus magdalenae var personii	Peirson's Milk-Vetch	Threatened	Endangered		1B	IMP
Astragalus nevinii	San Clemente Island Milk-Vetch	Species of Concern	None		1B	LA
Astragalus pachypus var jaegeri	Jaeger's Milk-Vetch	Species of Concern	None		1B	RIV
Astragalus preussii var laxiflorus	Lancaster Milk-Vetch	Species of Concern	None		1B	LA
Astragalus preussii var preussii	Preuss's Milk-Vetch	None	None		2	SB
Astragalus pyncnostachyus var lanosissimus	Ventura Marsh Milk-Vetch	Proposed Endangered	Endangered		1A	LA, OR, VEN
Astragalus traskiae	Trask's Milkvetch	Species of Concern	Rare		1B	VEN
Astragalus tricarinatus	Triple-Ribbed Milk Vetch	Endangered	None		1B	RIV, SB
Astrolepis cochisensis	Scaly Cloak Fern	None	None		2	SB
Atriplex coronata var notatior	San Jacinto Valley Crownscale	Endangered	None		1B	RIV
Atriplex coulteri	Coulter's Saltbrus	None	None		1B	LA, OR, SB
Atriplex pacifica	South Coast Saltscale	Species of Concern	None		1B	LA, OR, RIV, VEN
Atriplex parishii	Parish's Brittlescale	Species of Concern	None		1B	LA, OR, RIV, SB
Atriplex serenana var davidsonii	Davidson's Saltscale	None	None		1B	LA, OR, VEN
Ayenia compacta	Ayenia	None	None		2	RIV, SB
Baccharis malibuensis	Malibu Baccharis	None	None			LA
Berberis nevinii	Nevin's Barberry	Endangered	Endangered		1B	LA, RIV, SB
Berberis pinnata ssp insularis	Island Barberry	Endangered	Endangered		1B	VEN
Bergerocactus emoryi	Golden-Spined Cereus	None	None		2	LA
Botrychium crenulatum	Scalloped Moonwort	Species of Concern	None		1B	LA, SB
Bouteloua trifida	Red Grama	None	None		2	SB
Brodiaea flifolia	Thread-Leaved Brodiaea	Threatened	Endangered		1B	LA, OR, RIV, SB
Brodiaea kinkiensis	San Clemente Island Brodiaea	Species of Concern	None		1B	LA
Brodiaea orcutti	Orcutt's Brodiaea	Species of Concern	None		1B	RIV
Bursera microphylla	Elephant Tree	None	None		2	IMP
Calliandra eriophylla	Fairyduster	None	None		2	IMP

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Calochortus clavata var gracilis	Slender Mariposa Lily	Species of Concern	None		1B	LA
Calochortus palmeri var munzii	Munz's Mariposa Lily	Species of Concern	None		1B	RIV
Calochortus palmeri var palmeri	Palmer's Mariposa Lily	Species of Concern	None		1B	LA, RIV, SB, VEN
Calochortus plummerae	Plummer's Mariposa Lily	Species of Concern	None		1B	LA, OR, RIV, SB, VEN
Calochortus striatus	Alkali Mariposa Lily	Species of Concern	None		1B	LA, SB
Calochortus weedii var intermidius	Intermediate Mariposa Lily	Species of Concern	None		1B	LA, OR, RIV, SB
Calochortus weedii var vestus	Late-Flowered Mariposa Lily	Species of Concern	None		1B	VEN
Calystegia peirsonii	Peirson's Morning-Glory	Species of Concern	None		4	LA
Calystegia sepium ssp binghamiae	Santa Barbara Morning-Glory	None	None		1B	LA
Camissonia guadalupensis ssp clementina	San Clemente island Evening-Primrose	Species of Concern	None		1B	LA
Canbya candida	Pygmy Poppy	None	None		1B	LA, SB
Carex comosa	Bristly Sedge	None	None		2	SB
Carnegiea gigantea	Saguaro	None	None		2	IMP, SB
Castela emoryi	Crucifixion Thorn	None	None		2	IMP, RIV, SB
Castilleja cinerea	Ash-Gray Indian Paintbrush	Threatened	None		1B	SB
Castilleja gleasonii	Mt. Gleason Indian Paintbrush	Species of Concern	Rare		1B	LA
Castilleja grisea	San Clemente Island Indian Paintbrush	Endangered	Endangered		1B	LA
Castilleja lanata ssp hololeuca	White-Felted Indian Paintbrush	None	None		1B	VEN
Castilleja lasiorhyncha	San Bernardino Mountains Owl-Clover	Species of Concern	None		1B	RIV, SB
Caulanthus simulans	Payson's Jewel-Flower	Species of Concern	None		4	OR, RIV, SB
Ceanothus cyaneus	Lakeside Ceanothus	Species of Concern	None		1B	RIV
Ceanothus ophiochilus	Vail Lake Ceanothus	Threatened	Endangered		1B	RIV
Cercocarpus traskiae	Catalina Island Mountain-Mohagany	Endangered	Endangered		1B	LA
Chaenactis carphoclinia var peirsonii	Peirson's Pincushion	None	None		1B	IMP
Chamaesyce arizonica	Arizona Spurge	None	None		2	RIV
Chamaesyce platysperma	Flat-Seeded Spurge	Species of Concern	None		1B	RIV, SB
Cheilanthes wootonii	Wooton's Lace Fern	None	None		2	SB
Chorizanthe parryi var fernandina	San Fernando Valley Spineflower	Species of Concern	Candidate Endangered		1A	LA
Chorizanthe parryi var parryi	Parry's Spineflower	Species of Concern	None		3	LA, RIV, SB

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Chorizanthe polygonoides var longispina	Long-Spined Spineflower	Species of Concern	None		1B	RIV
Claytonia lanceolata var peirsonii	Peirson's Spring Beauty	Species of Concern	None		1B	SB
Comarostaphylis diversifolia ssp diversifolia	Summer Holly	Species of Concern	None		1B	OR, RIV
Cordylanthus maritimus ssp maritimus	Salt Marsh Bird's-Beak	Endangered	Endangered		1B	LA, OR, SB, VEN
Cordylanthus parviflorus	Purple Bird's-Beak	None	None		1B	SB
Cordylanthus tecopensis	Tecopa Bird's-Beak	Species of Concern	None		1B	SB
Croton wigginsii	Wiggin's Croton	None	Rare		2	IMP
Cryptantha clokeyi	Clokey's Cryptantha	None	None		1B	SB
Cryptantha traskiae	Trask's Cryptantha	Species of Concern	None		1B	LA, VEN
Cupressus forbesii	Tecate Cypress	Species of Concern	None		1B	OR, RIV
Cymopterus deserticola	Desert Cymopterus	Species of Concern	None		1B	LA, SB
Cymopterus gilmanii	Gilman's cymopterus	None	None		2	SB
Delphinium hesperium ssp cuyamacae	Cuyamaca Larkspur	Species of Concern	Rare		1B	RIV
Delphinium parryi ssp blochmaniae	Dune Larkspur	Species of Concern	None		1B	VEN
Delphinium variegatum ssp kinkiense	San Clemente Island Larkspur	Endangered	Endangered		1B	LA
Delphinium variegatum ssp thornei	Thorne's Royal Larkspur	Species of Concern	None		1B	LA
Dendromecon harfordii var rhamnoides	Island Tree Poppy	Species of Concern	None		1B	LA
Dissanthelium californicum	California Dissanthelium	Species of Concern	None		1A	LA
Ditaxis californica	California Ditaxis	Species of Concern	None		1B	RIV
Ditaxis clariana	Glandular Ditaxis	None	None		2	IMP, SB
Dithyrea maritima	Beach Spectaclepod	Species of Concern	Threatened		1B	LA, VEN
Dodecahema leptoceras	Slender-Horned Spineflower	Endangered	Endangered		1B	LA, RIV, SB
Dryopteris filix-mas	Male Fern	None	None		2	SB
Dudleya abramsii ssp affinis	San Bernardino Mountains Dudleya	Species of Concern	None		1B	SB
Dudleya abramsii ssp parva	Conejo Dudleya	Threatened	None		1B	VEN
Dudleya blochmaniae ssp blochmaniae	Blochman's Dudleya	Species of Concern	None		1B	LA, OR, VEN
Dudleya cymosa ssp crebrifolia	San Gabriel River Dudleya	Species of Concern	None		1B	LA
Dudleya cymosa ssp marcescens	Marcescent Dudleya	Threatened	Rare		1B	LA, VEN
Dudleya cymosa ssp ovatifolia	Santa Monica Mountains Dudleya	Threatened	None		1B	LA, OR, VEN
Dudleya densiflora	San Gabriel Mountains Dudleya	Species of Concern	None		1B	LA
Dudleya multicaulis	Many-Stemmed Dudleya	Species of Concern	None		1B	LA, OR, RIV, SB

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Dudleya stolonifera	Laguna Beach Dudleya	Threatened	Threatened		1B	OR
Dudleya verityi	Verity's Dudleya	Threatened	None		1B	VEN
Dudleya virens	Bright Green Dudleya	Species of Concern	None		1B	LA, VEN
Dudleya viscida	Stick Dudleya	Species of Concern	None		1B	OR, RIV
Echinocereus engelmannii var howei	Howe's Hedgehog Cactus	Species of Concern	None		1B	SB
Enneapogon desvauxii	Nine-Awned Pappus Grass	None	None		2	SB
Eriastrum densifolium ssp sanctorum	Santa Ana River Woollystar	Endangered	Endangered		1B	OR, RIV, SB
Erigeron breweri var bisanctus	Pious Daisy	None	None		1B	LA, SB
Erigeron parishii	Parish's Daisy	Threatened	None		1B	RIV, SB
Erigeron uncialis var uncialis	Limesone Daisy	None	None		2	SB
Eriogonum bifurcatum	Forked Buckwheat	Species of Concern	None		1B	SB
Eriogonum crocatum	Conejo Buckwheat	Species of Concern	Rare		1B	VEN
Eriogonum ericifolium var thornei	Thorne's Buckwheat	Species of Concern	Endangered		1B	SB
Eriogonum foliosum	Leafy Buckwheat	None	None		1B	RIV
Eriogonum giganteum var formosum	San Clemente Island Buckwheat	Species of Concern	None		1B	LA
Eriogonum grande var timorum	San Nicolas Island Buckwheat	Species of Concern	Endangered		1B	VEN
Eriogonum kennedyi var alpigenum	Southern Alpine Buckwheat	None	None		1B	LA, SB
Eriogonum kennedyi var austromontanum	Southern Mountain Buckwheat	Threatened	None		1B	SB
Eriogonum microthecum var johnstonii	Johnston's Buckwheat	Species of Concern	None		1B	LA, SB
Eriogonum ovalifolium var vineum	Cushenbury Buckwheat	Endangered	None		1B	SB
Eriogonum umbellatum var juniporinum	Juniper Buckwheat	None	None		2	SB
Erioneuron pilosum	Hair Erioneuron	None	None		2	SB
Eriophyllum mohavense	Barstow Woolly Sunflower	Species of Concern	None		1B	SB
Eriophyllum nevinii	Nevin's Woolly Sunflower	Species of Concern	None		1B	LA
Eryngium aristulatum var parishii	San Diego Button Celery	Endangered	Endangered		1B	RIV
Erysimum insulare ssp insulare	Island Wallflower	Species of Concern	None		1B	VEN
Eschscholzia minutiflora ssp twisselmannii	Red Rock Poppy	Species of Concern	None		1B	SB
Escobaria vivipara var alversonii	Foxtail Cactus	Species of Concern	None		1B	RIV, SB
Escobaria vivipara var rosea	Viviparous Foxtail Cactus	None	None		1B	SB
Eucnide repestris	Rock Nettle	None	None		2	IMP
Euphorbia exstipulata var exstipulata	Clark Mountain Spurge	None	None		2	SB

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Euphorbia misera	Cliff Spruge	None	None		2	LA, OR, RIV
Fimbristylis thermalis	Hot Springs Fimbristylis	None	None		2	SB
Fritillaria ojaiensis	Ojai Fritillary	Species of Concern	None		1B	VEN
Fremontodendrom mexicanum	Mexican Flannelbush	Endangered	Rare		1B	LA
Galium angustifolium ssp jacinticum	San Jacinto Mountains Bedstraw	None	None		1B	RIV
Galium californicum ssp primum	California Bedstraw	Species of Concern	None		1B	RIV, SB
Galium catalinense ssp acrispum	San Clemente Island Bedstraw	Species of Concern	Endangered		1B	LA
Galium grande	San Gabriel Bedstraw	Species of Concern	None		1B	LA
Galium hilendiae ssp kingstonense	Kinston Mountains Bedstraw	Species of Concern	None		1B	SB
Gallium wrightii	Wright's Bedstraw	None	None		2	SB
Galvezia speciosa	Island Snapdragon	Species of Concern	None		1B	LA
Gentiana fremontii	Moss Gentian	None	None		2	SB
Geraea viscida	Sticky Geraea	None	None		2	IMP
Gilia maculata	Little San Bernardino Mountains Gilia	Species of Concern	None		1B	RIV, SB
Gilia ripleyi	Ripley's Gila	None	None		2	SB
Githopsis diffusa ssp filicaulis	Mission Canyon Bluecup	Species of Concern	None		1B	RIV
Glossopetalon pungens	Pungent Glossopetalon	Species of Concern	None		1B	SB
Harpagonella palmeri	Palmer's Grapplinghook	Species of Concern	None		2	LA, OR, RIV
Hazardia cana	San Clemente Island Hazardia	Species of Concern	None		1B	LA
Helianthemum greenei	Island Rush-Rose	Threatened	None		1B	LA
Helianthus niveus ssp tephrodes	Algodones Dune's Sunflower	Species of Concern	Endangered		1B	IMP
Helianthus nuttallii ssp parishii	Los Angeles Sunflower	Species of Concern	None		1A	LA, OR, SB
Hemizonia minthornii	Santa Susana Tarplant	Species of Concern	Rare		1B	LA, VEN
Hemizonia mohavensis	Mojave Tarplant	Species of Concern	Endangered		1A	RIV, SB
Hemizonia parryi ssp australis	Southern Tarplant	Species of Concern	None		1B	LA, OR, VEN
Hemizonia pungens ssp laevis	Smooth Tarplant	Species of Concern	None		1B	RIV, SB
Herissantia crispa	Curly Herissantia	None	None		2	IMP
Heuchera hirsuitissima	Shaggy-Haired Alumroot	None	None		1B	RIV
Heuchera maxima	Island Alumroot	Species of Concern	None		1B	VEN
Heuchera parishii	Parish's Alumroot	None	None		1B	RIV, SB
Horkelia wilderae	Barton's Flat Horkelia	Species of Concern	None		1B	SB

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Hulsea mexicana	Mexican Hulsea	None	None		2	IMP
Ipomopsis effusa	Baja California Ipomopsis	None	None		2	IMP
Ipomopsis tenuifolia	Slender-leaved Ipomopsis	None	None		2	IMP
Ivesia argyrocoma	Silver-Haired Ivesia	Species of Concern	None		1B	SB
Ivesia callida	Tahquitz Ivesia	Species of Concern	Rare		1B	RIV
Koeberlinia spinosa ssp tenuispina	Crown-of-Thorns	None	None		2	IMP
Lasthenia glabrata ssp coulteri	Coulter's Goldfields	Species of Concern	None		1B	LA, OR, RIV, SB, VEN
Lavatera assurgentiflora ssp assurgentiflora	Island Mallow	Species of Concern	None		1B	VEN
Lavatera assurgentiflora ssp glabra	Southern Island Mallow	Species of Concern	None		1B	LA
Layia heterotricha	Pale-Yellow Layia	Species of Concern	None		1B	VEN
Lepechenia cardiophylla	Heart-Leaved Pitcher Sage	Species of Concern	None		1B	OR, RIV
Lepidium virginicum var robinsonii	Robinson's Pepper-Grass	None	None		1B	LA, OR, RIV, SB
Leptodactylon jaegeri	San Jacinto Prickly Phlox	None	None		1B	RIV
Lesquerella kingii ssp bernardina	San Bernardino Mountains Bladderpod	Endangered	None		1B	SB
Lilium parryi	Lemon Lily	Species of Concern	None		1B	LA, RIV, SB
Limnanthes gracilis ssp parishii	Parish's Meadowfoam	Species of Concern	Endangered		1B	RIV
Linanthus arenicola	Sand Linanthus	None	None		2	SB
Linanthus concinnus	San Gabriel Linanthus	Species of Concern	None		1B	LA, SB
Linanthus floribundus ssp hallii	Santa Rosa Mountains Linanthus	None	None		1B	RIV
Linanthus killipii	Baldwin Lake Linanthus	Species of Concern	None		1B	SB
Linanthus orcuttii	Orcutt's Linanthus	Species of Concern	None		1B	RIV, SB
Linanthus pygmaeus ssp pygmaeus	Pygmy Linanthus	None	None		1B	LA
Lithophragma maximum	San Clemente Island Woodland Star	Endangered	Endangered		1B	LA
Loeflingia squarrosa var artemisiarum	Sagebrush leflingia	None	None		1B	LA
Lomatium insulare	San Nicolas Island Lomatium	Species of Concern	None		1B	LA, VEN
Lotus argophyllus var adsurgens	San Clemente Island Bird's-Foot Trefoil	Species of Concern	Endangered		1B	LA
Lotus argyraeus var multicaulis	Scrub Lotus	None	None		1B	SB
Lotus argyraeus var notitius	Providence Mountains Lotus	None	None		1B	SB
Lotus dendroideus var traskiae	San Clemente Island Lotus	Endangered	Endangered		1B	LA

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Lupinus excubitus var medius	Mountain Springs Bush Lupine	Species of Concern	None		1B	IMP
Lupinus guadalupensis	Guadalupe Island Lupine	Species of Concern	None		1B	LA
Lycium brevipes var hassei	Santa Catalina Island Desert-Thorn	None	None		1B	LA
Lycium parishii	Parhish's Desert-Thorn	None	None		2	IMP, RIV, SB
Lycium verrucosum	San Nicolas Island Desert-Thorn	None	None		1A	VEN
Lycurus phleoides var phleoides	Wolftail	None	None		2	SB
Lyonothamnus floribundus ssp asplenifolius	Santa Cruz Island Ironwood	Species of Concern	None		1B	LA
Lyonothamnus floribundus ssp floribundus	Santa Catalina Island Ironwood	Species of Concern	None		1B	LA
Machaeranthera canescens var ziegleri	Ziegler's Aster	None	None		1B	RIV
Malacothamnus clementinus	San Clemente Island Bush Mallow	Endangered	Endangered		1B	LA
Malacothamnus davidsonii	Davidson's Bush Mallow	Species of Concern	None		1B	LA
Malacothamnus parishii	Parish's Bush Mallow	Species of Concern	None		1A	SB
Malacothrix squalida	Island Malacothrix	Endangered	None		1B	VEN
Malaxis monophyllos ssp brachypoda	Adder's-Mouth	None	None		2	RIV, SB
Malperia tenuis	Brown Turbans	None	None		2	IMP
Marina orcuttii var orcuttii	California Marina	Species of Concern	None		1B	RIV
Matelea parvifolia	Spearleaf	None	None		2	RIV, SB
Maurandya antirrhiniflora ssp antirrhiniflora	Violet Twining Snapdragon	None	None		2	SB
Mentzelia hirsutissima	Hairy Stickleaf	None	None		2	IMP
Mimulus exiguus	San Bernardino Mountains Monkeyflower	Species of Concern	None		1B	SB
Mimulus mohavensis	Mohave Monkeyflower	Species of Concern	None		1B	SB
Mimulus purpureus	Purple Monkeyflower	Species of Concern	None		2	SB
Mimulus traskiae	Santa Catalina Island Monkeyflower	Species of Concern	None		1A	LA
Monardella hypoleuca ssp lanata	Felt-Leaved Monardella	None	None		1B	OR
Monardella linoides ssp oblonga	Flax-Like Monardella	Species of Concern	None		1B	VEN
Monardella macrantha ssp hallii	Hall's Monardella	None	None		1B	LA, OR, RIV, SB
Monardella pringlei	Pringle's Monardella	Species of Concern	None		1A	RIV, SB
Monardella robisonii	Robison's Monardella	Species of Concern	None		1B	RIV, SB

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Muhlenbergia appressa	Appressed Muhly	None	None		2	LA, SB
Muhlenbergia arsenei	Tough Muhly	None	None		2	SB
Muhlenbergia californica	California Muhly	None	None		1B	LA, SB
Muhlenbergia fragilis	Delicate Muhly	None	None		2	SB
Muhlenbergia pauciflora	Few-Flowered Muhly	None	None		2	SB
Muilla clevelandii	San Diego Goldenstar	Species of Concern	None		1B	RIV
Munroa squarrosa	False Buffalo-Grass	None	None		2	SB
Myosurus minimus ssp apus	Little Mousetail	Species of Concern	None		3	RIV
Nama dichotomum var dichotomum	Forked Purple Mat	None	None		2	SB
Nama stenocarpum	Mud Nama	None	None		2	IMP, LA
Navarretia fossalis	Spreading Navarretia	Threatened	None		1B	RIV
Navarretia peninsularis	Baja Navarretia	None	None		1B	SB, VEN
Nemacaulis denudata var denudata	Coast Woolly-Heads	None	None		2	LA, OR
Nenmacaulis denudata var gracilis	Slender Woolly-Heads	None	None		2	IMP, RIV, SB
Opuntia basilaris var brachyclada	Short-Joint Beavertail	Species of Concern	None		1B	LA, SB
Opuntia curvospina	Curved-Spine Beavertail	None	None		2	SB
Opuntia munzii	Munz's Cholla	Species of Concern	None		1B	IMP, RIV
Opuntia wigginsii	Wiggin's Cholla	None	None		3	IMP, RIV
Orcuttia californica	California Orcutt Grass	Endangered	Endangered		1B	LA, RIV, VEN
Orobanche parishii ssp brachyloba	Short-Lobed Broom-Rape	Species of Concern	None		1B	LA, VEN
Orobanche valida ssp valida	Rock Creek Broom-Rape	Species of Concern	None		1B	LA, VEN
Oxytheca parishii var abramsii	Abram's Oxytheca	None	None		1B	VEN
Oxytheca parishii var cienegensis	Cienega Seca Oxytheca	Species of Concern	None		1B	SB
Oxytheca parishii var goodmaniana	Cushenbury Oxytheca	Endangered	None		1B	SB
Palafoxia arida var gigantea	Giant Spanish-Needle	Species of Concern	None		1B	IMP
Pellaea truncata	Cliff Brake	None	None		2	SB
Penstemon calcareus	Limestone Beardtongue	None	None		2	SB
Penstemon californicus	California Beardtongue	None	None		1B	RIV
Penstemon stephensii	Stephen's Beardtongue	Species of Concern	None		1B	SB
Pentachaeta lyonii	Lyon's Pentachaeta	Endangered	Endangered		1B	LA, VEN
Perideridia parishii ssp parishii	Parish's Yampah	None	None		2	SB
Phacelia anelsonii	Aven Nelson's Phacelia	None	None		1B	SB
Phacelia cinerea	Ashy Phacelia	Species of Concern	None		1A	VEN

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Phacelia floribunda	Many-Flowered Phacelia	Species of Concern	None		1B	LA
Phacelia mustelina	Death Valley Round-Leaved Phacelia	None	None		1B	SB
Phacelia parishii	Parish's Phacelia	Species of Concern	None		2	SB
Phacelia pulchella var gooddingii	Goodding's Phacelia	None	None		2	SB
Phacelia stellaris	Brand's Phacelia	None	None		1B	LA
Phacelia suaveolens ssp keckii	Santiago Peak Phacelia	Species of Concern	None		1B	OR, RIV
Phaseolus filiformis	Slender-Stem Bean	None	None		2	RIV
Phlox dolichantha	Big Bear Valley Phlox	Species of Concern	None		1B	SB
Pholisma sonorae	Sand Food	Species of Concern	None		1B	IMP
Pholistoma auritum var arizonicum	Arizona Pholistoma	None	None		2	SB
Physalis lobata	Lobed Ground-Cherry	None	None		2	SB
Pilostyles thurberi	Thurber's Pilostyles	None	None		4	IMP
Piptatherum micranthus	Small-Flowered Rice Grass	None	None		2	SB
Poa atropurpurea	San Bernardino Blue Grass	Endangered	None		1B	SB
Poliomintha incana	Frosted Mint	None	None		1A	SB
Populus angustifolia	Narrow-Leaved Cottonwood	None	None		2	SB
Potentilla glandulosa ssp ewanii	Ewan's Cinquefoil	None	None		1B	LA
Potentilla multijuga	Ballona Cinquefoil	Species of Concern	None		1A	LA
Potentilla rimicola	Cliff Cinquefoil	None	None		1B	RIV
Puccinellia parishii	Parish's Alkali Grass	Species of Concern	None		1B	SB
Pyrrocoma uniflora var gossypina	Bear Valley Pyrrocoma	Species of Concern	None		1B	SB
Quercus dumosa	Nuttall's Scrub Oak	Species of Concern	None		1B	OR
Ribes divaricatum var parishii	Parish's Gooseberry	Species of Concern	None		1B	LA, SB
Rorippa gambelii	Gambel's Water Cress	Endangered	Threatened		1B	SB
Sagittaria sanfordii	Sanford's Arrowhead	Species of Concern	None		1B	OR, VEN
Salvia greatae	Orocopia Sage	Species of Concern	None		1B	RIV, SB
Sanvitalia abertii	Abert's Sanvitalia	None	None		2	SB
Satureja chandleri	San Miguel Savory	None	None		4	OR, RIV
Scleropogon brevifolius	Burro Grass	None	None		2	SB
Scrophularia villosa	Santa Catalina Figwort	Species of Concern	None		1B	LA
Scutellaria bolanderi ssp austromontana	Southern Skullcap	None	None		1B	LA, RIV, SB
Selaginella eremophila	Desert Spike-Moss	None	None		2	IMP, RIV

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Senecio aphanactis	Rayless Ragwort	None	None		2	LA, OR, VEN
Senecio bernardinus	San Bernardino Ragwort	Species of Concern	None		1B	SB
Senna covesii	Coves's Cassia	None	None		2	RIV, SB
Sibara filifolia	Santa Cruz Island Rock Cress	Endangered	None		1B	LA
Sidalcea hickmanii ssp parishii	Parish's Checkerbloom	Candidate	Rare		1B	SB
Sidalcea neomexicana	Salt Spring Checkerbloom	None	None		2	LA, RIV, SB, VEN
Sidalcea pedata	Bird-Foot Checkerbloom	Endangered	Endangered		1B	SB
Sphaeralcea rusbyi var eremicola	Rusby's Desert-Mallow	Species of Concern	None		1B	SB
Sphenopolis obtusata	Prairie Wedge Grass	None	None		2	SB
Stephanomeria blairii	Blair's Stephanomeria	Species of Concern	None		1B	LA
Streptanthus bernardinus	Laguna Mountains Jewel-Flower	None	None		1B	RIV, SB
Streptanthus campestris	Southern Jewel-Flower	None	None		1B	RIV, SB
Stylocline masonii	Mason's Neststraw	Species of Concern	None		1B	LA
Stylocline sonorensis	Mesquite Neststraw	None	None		2	RIV
Taraxacum californicum	California Dandelion	Endangered	None		1B	SB
Tetracoccus dioicus	Parry's Tetracoccus	Species of Concern	None		1B	OR, RIV
Thelypodium stenopetalum	Slender-Petaled Thelypodium	Endangered	Endangered		1B	SB
Thelypteris puberula var sonorensis	Sonoran Maiden Fern	None	None		2	LA, RIV, SB
Trichocoronis wrightii var wrightii	Wright's Trichocoronis	None	None		1B	RIV
Trichostema austromontanum ssp compactum	Hidden Lake Bluecurls	Threatened	None		1B	RIV
Triteleia clementina	San Clemente Island Triteleia	Species of Concern	None		1B	LA
Verbesina dissita	Crownbeard	Threatened	Threatened		1B	OR
Viola aurea	Golden Violet	None	None		2	SB
Wislizenia refracta ssp refracta	Jackass-Clover	None	None		2	RIV, SB
Woodsia plummerae	Plummer's Woodsia	None	None		2	SB
Xylorhiza cognata	Mecca-Aster	Species of Concern	None		1B	IMP, RIV
Xylorhiza orcuttii	Orcutt's Woody-Aster	Species of Concern	None		1B	IMP
SNAILS AND SLUGS						
Eremarionta immaculata	White Desertsnail	Species of Concern	None			RIV
Eremarionta morongoana	Morongo (=Colorado) Desertsnail	Species of Concern	None			RIV
Eremarionta rowelli mccoiana	California McCoy Snail	Species of Concern	None			RIV

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Haplotrema catalinense	Santa Catalina Lancetooth	None	None			LA
Helminthoglypta ayresiana sanctaecrucis	Ayer's Snail	None	None			VEN
Helminthoglypta mohaveana	Victorville Shoulderband	Species of Concern	None			SB
Micrarionta feralis	San Nicolas Islandsnail	Species of Concern	None			VEN
Micrarionta gabbi	San Clemente Islandsnail	Species of Concern	None			LA
Micrarionta opuntia	Pricklypear Islandsnail	Species of Concern	None			VEN
Pristiloma shepardae	Shepard's Snail	None	None			LA
Radiocentrum (=oreohelix) avalonense	Catalina Mountain Snail	Species of Concern	None			LA
Sterkia clementina	San Clemente Island Blunt-Top Snail	None	None			LA, VEN
Tryonia imitator	Mimic Tryonia (=CA Brackwaterish Snail)	Species of Concern	None			LA, OR, VEN
Xerarionta intercisa	Horseshoe Snail	None	None			LA
Xerionata redimita	Wreathed Island Snail	None	None			LA
CRUSTACEANS						
Branchinecta lynchi	Vernal Pool Fairy Shrimp	Threatened	None			RIV, VEN
Branchinecta sandiegonensis	San Diego Fairy Shrimp	Endangered	None			OR
Streptocephalus woottoni	Riverside Fairy Shrimp	Endangered	None			OR, RIV, VEN
GRASSHOPPERS, KATYDIDS, AND CRICKETS						
Ammopelmatus kelsoensis	Kelso Jerusalem Cricket	Species of Concern	None			SB
Macrobaenetes kelsoensis	Kelso Giant Sand Treader Cricket	Species of Concern	None			SB
Macrobaenetes valgum	Coachella Giant Sand Treader Cricket	Species of Concern	None			RIV
Neduba longipennis	Santa Monica Shieldback Katydid	Species of Concern	None			LA
Psychomastix deserticola	Desert Monkey Grasshopper	Species of Concern	None			SB
Stenopelmatus cahuilaensis	Coachella Valley Jerusalem Cricket	Species of Concern	None			RIV
TRUE BUGS						
Belostoma saratogae	Saratoga Springs Belostoman Bug	Species of Concern	None			SB
Pelocoris shosone	Amargosa Naucorid Bug	Species of Concern	None			SB
LACEWINGS						
Oliarces clara	Cheeseweed Owlfly	Species of Concern	None			RIV, SB

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
BEETLES						
Anomala carlsoni	Carlson's Dune Beetle	None	None			IMP
Anomala hardyorum	Hardy's Dune Beetle	None	None			IMP
Cicindela gabbii	Tiger Beetle	None	None			OR
Cicindela hirticolllis gravida	Sandy Beach Tiger Beetle	Species of Concern	None			LA, VEN
Cicindela senilis frosti	Tiger Beetle	None	None			LA, OR, VEN
Coelus globosus	Globose Dune Beetle	Species of Concern	None			LA, VEN
Hydroporus simplex	Simple Hydroporous Diving Beetle	Species of Concern	None			SB
Polyphylla eratica	Death Valley June Beetle	Species of Concern	None			SB
Onychobaris langei	Lange's El Segundo Dune Weevil	Species of Concern	None			LA
Pseudocotalpa andrewsi	Andrew's Dune Scarab Beetle	Species of Concern	None			IMP
Trigonoscuta dorothea dorothea	Dorothy's El Segundo Dune Weevil	Species of Concern	None			LA, OR
FLIES						
Brennania belkini	Belkin's dune Tabanid Fly	None	None			LA
Rhaphiomidas terminatus abdominalis	Delhi Sands Flower-Loving Fly	Endangered	None			SB
BUTTERFLIES AND MOTHS						
Danaus plexippus	Monarch Butterfly	None	None			LA, OR, VEN
Eucosma hennei	Henne's Eucosman Moth	Species of Concern	None			LA
Euchloe hyantis andrewsi	Andrew's Marble Butterfly	Species of Concern	None			SB
Euphilotes battoides allyni	El Segundo Blue Butterfly	Endangered	None			LA
Euphydryas editha quino	Quino Checkerspot Butterfly	Endangered	None			RIV
Glaucopsyche lygdamus palosverdesensis	Palos Verdes Blue Butterfly	Endangered	None			LA
Panoquina errans	Wandering (=Saltmarsh) Skipper	Species of Concern	None			LA, OR, VEN
FISH						
Catostomus santaanae	Santa Ana Sucker	Threatened	None	SC		LA, OR, RIV, SB, VEN
Cyprinodon macularius	Desert Pupfish	Endangered	Endangered			IMP, RIV
Cyprinodon nevadensis amargosae	Armagos Pupfish	None	None	SC		SB
Cyprinodon nevadensis williamsoni	Saratoga Springs Pupfish	None	None	SC		SB

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Eucyclogobius newberryi	Tidewater Goby	Endangered (proposed de-listing north of Orange County)	None	SC		LA, OR, VEN
Gasterosteus aculeatus williamsoni	Unarmored Threespine Stickleback	Endangered	Endangered			LA, SB, VEN
Gila bicolor mohavensis	Mohave Tui Chub	Endangered	Endangered			LA, SB
Gila orcutti	Arroyo Chub	Species of Concern	None	SC		LA, OR, RIV, VEN
Oncorhynchus mykiss irideus	Southern Steelhead	Endangered	None	SC		LA, VEN
Ptychocheilus lucius	Colorado Squawfish	Endangered	Endangered			IMP
Rhinichthys osculus ssp 1	Amargosa Canyon Speckled Dace	Species of Concern	None	SC		SB
Xyrauchen texanus	Razorback Sucker	Endangered	Endangered			IMP, RIV, SB
AMPHIBIANS						
Ambystoma californianse	California Tiger Salamander	Candidate	None			RIV
Batrachoseps aridus	Desert Slender Salamander	Endangered	Endangered	SC		RIV
Batrachoseps sp 5	Guadalupe Creek Slender Salamander	None	None			RIV
Bufo microscaphus californicus	Arroyo Toad	Endangered	None	SC		LA, OR, RIV, SB, VEN
Ensatina eschscholtzii klauberi	Large-Blotched Salamander	Species of Concern	None	SC		RIV
Rana aurora draytonii	California Red-Legged Frob	Threatened	None	SC		LA, RIV, SB
Rana muscosa	Mountain Yellow-Legged Frog	Species of Concern	None	SC		LA, RIV
Scaphiopus hammondii	Western Spadefoot	Species of Concern	None	SC		LA, OR, RIV, VEN
Taricha torosa torosa	Coast Range Newt	None	None	SC		LA, OR
REPTILES						
Anniella pulchra pulchra	Silvery Legless Lizard	Species of Concern	None	SC		LA, RIV
Charina bottai umbratica	Southern Rubber Boa	Species of Concern	Threatened			RIV, SB, VEN
Clemmys marmorata pallida	Southwestern Pond Turtle	Species of Concern	None	SC		LA, OR, RIV, SB,VEN
Cnemidophorus hyperythrus	Orange-Throated Whiptail	Species of Concern	None	SC		LA, OR, RIV, SB
Cnemidophorus tigris multiscutatus	Coastal Western Whiptail	Species of Concern	None			LA, RIV, SB, VEN
Coleonyx switaki	Bare-footed Banded Gecko	Species of Concern	Threatened			IMP

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Crotalus ruber ruber	Northern Red-Diamond Rattlesnake	Species of Concern	None	SC		OR, RIV
Diadophis punctatus modestus	San Bernardino Ringneck Snake	Species of Concern	None			SB
Gambelia sila	Blunt-Nosed Leopard Lizard	Endangered	Endangered			VEN
Heloderma suspectum cinctum	Banded Gila Monster	Species of Concern	None	SC		SB
Lampropeltis zonata parvirubra	San Bernardino Mountain Kingsnake	None	None			LA, SB
Lampropeltis zonata pulchra	San Diego Mountain Kingsnake	Species of Concern	None	SC		LA, OR
Phrynosoma coronatum blainvillei	San Diego Horned Lizard	Species of Concern	None	SC		LA, OR, RIV, SB, VEN
Phrynosoma coronatum frontale	California Horned Lizard	Species of Concern	None	SC		LA
Phrynosoma mcalli	Flat-Tailed Horned Lizard	None	None	SC		IMP, RIV
Salvadora hexalepsis virgultea	Coast Patch-Nosed Snake	Species of Concern	None	SC		OR
Thamnophis couchi ssp	Santa Catalina Garter Snake	None	None			LA
Thamnophis hammondii	Two-Striped Garter Snake	Species of Concern	None	SC		OR, RIV, SB, VEN
Uma inornata	Coachella Valley Fringe-Toed Lizard	Threatened	Endangered			RIV
Xantusia riversiana	Island Night Lizard	Threatened	None			LA, VEN
Xerobates agassizii	Desert Tortoise	Threatened	Threatened			IMP, LA, RIV, SB
BIRDS						
Accipiter cooperii (nesting)	Cooper's Hawk	None	None	SC		IMP, LA, OR, RIV, SB, VEN
Agelaius tricolor (nesting colony)	Tricolored Blackbird	Species of Concern	None	SC		LA, OR, RIV, VEN
Aimophila ruficeps canescens	Southern California Rufous-Crowned Sparrow	Species of Concern	None	SC		RIV, VEN
Amphispiza belli clementeae	San Clemente Sage Sparrow	Threatened	None			LA, RIV
*Aquila chrysaetos (*nesting and wintering)	Golden Eagle	None	None	SC		OR, RIV, SB
Ardea alba	Great Egret	None	None			IMP, RIV
Ardea herodias (rookery)	Great Blue Heron	None	None			IMP, RIV
Asio flammeus (nesting)	Short-Eared Owl	None	None	SC		IMP, LA,
Asio otus (nesting)	Long-Eared Owl	None	None	SC		RIV, SB

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Athene cunicularia (burrow sites)	Burrowing Owl	Species of Concern	None	SC		IMP, LA, OR, RIV, SB, VEN
Buteo swainsoni (nesting)	Swainson's Hawk	None	Threatened			LA, SB
Campylorhynchus brunneicapillus couesi	Coastal Cactus Wren	None	None	SC		OR
Cardinalis cardinalis superba	Northern Cardinal	None	None	SC		RIV, SB
Charadrius alexandrinus nivosus (nesting)	Western Snowy Plover	Threatened	None	SC		LA, OR, RIV, SB, VEN
Circus cyaneus (nesting)	Northern Harrier	None	None	SC		OR
Coccyzus americanus occidentalis (nesting)	Western Yellow-Billed Cuckoo	Candidate	Endangered			LA, IMP, RIV, SB, VEN
Colaptes chrysoides	Gilded Flicker	None	Endangered			IMP, RIV
Cypseloides niger (nesting)	Black Swift	None	None	SC		LA, RIV, SB
Dendroica petechia brewsteri (nesting)	Yellow Warbler	None	None	SC		IMP, RIV, SB, VEN
Dendroica petechia sonorana (nesting)	Sonoran Yellow Warbler	None	None	SC		IMP, RIV, SB
Egretta thula (rookery)	Snowy Egret	None	None			RIV
Elanus leucurus (nesting)	White-Tailed Kite	None	None			RIV
Empidonax traillii (nesting)	Willow Flycatcher	None	Endangered			IMP, RIV, SB
Falco mexicanus	Prairie Falcon	None	None	SC		IMP, LA, RIV, SB, VEN
Gymnogyps californianus	California Condor	Endangered	Endangered			LA, VEN
Haliaeetus leucocephalus (nesting and wintering)	Bald Eagle	Threatened	Endangered			RIV, SB
Icteria virens (nesting)	Yellow-Breasted Chat	None	None	SC		IMP, OR, RIV, SB, VEN
Junco hyemalis caniceps (nesting)	California Gray-Headed Junco	None	None	SC		IMP, RIV, SB
Lanius ludovicianus mearnsi	San Clemente Loggerhead Shrike	Endangered	None			LA
Laterallus jamaicensis coturniculus	California Black Rail	Species of Concern	Threatened			IMP, LA, OR
Melanerpes uropysialis	Gila Woodpecker	None	Endangered			IMP, RIV, SB
Micrathene whitneyi (nesting)	Elf Owl	None	Endangered			IMP, RIV, SB
Myiarchus tyrannulus (nesting)	Brown-Crested Flycatcher	None	None	SC		IMP, RIV, SB
Nycticorax nycticorax	Black-Crowned Night Heron	None	None			RIV
Passerculus sandwichensis beldingi	Belding's Savannah Sparrow	Species of Concern	Endangered			LA, OR, VEN

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Pelecanus occidentalis californicus (nesting colony)	California Brown Pelican	Endangered	Endangered			VEN
Phalacrocorax auritus (rookery site)	Double-Crested Cormorant	None	None	SC		VEN
Piranga flava (nesting)	Hepatic Tanager	None	None	SC		SB
Piranga rubra (nesting)	Summer Tanager	None	None	SC		IMP, RIV, SB
Polioptila californica	California Gnatcatcher	Threatened	None	SC		LA, OR, RIV, SB, VEN
Polioptila melanura	Black-Tailed Gnatcatcher	None	None			IMP, RIV
Pyrocephalus rubinus (nesting)	Vermilion Flycatcher	None	None	SC		IMP, RIV, SB
Rallus longirostris levipes	Light-Footed Clapper Rail	Endangered	Endangered			OR, VEN
Rallus longirostris yumanensis	Yuma Clapper Rail	Endangered	Threatened			IMP, RIV, SB
Rallus niger (nesting colony)	Black Skimmer	None	None	SC		IMP
Riparia riparia (nesting)	Bank Swallow	None	Threatened			VEN
Sterna antillarum browni (nesting colony)	California Least Tern	Endangered	Endangered			LA, OR, VEN
Sterna caspia (nesting colony)	Caspian Tern	None	None			IMP
Sterna nilotica vanrossemi (nesting colony)	Van Rossem's Gull-Billed Tern	Species of Concern	None	SC		IMP, RIV
Toxostoma bendirei	Bendire's Thrasher	None	None	SC		RIV, SB
Toxostoma crissale	Crissal Thrasher	None	None	SC		IMP, RIV, SB
Toxostoma lecontei	Le Conte's Thrasher	None	None	SC		IMP, LA, RIV, SB
Vermivora virginiae (nesting)	Virginia's Warbler	None	None	SC		SB
Vireo bellii arizonae (nesting)	Arizona Bell's Vireo	None	Endangered			IMP, SB
Vireo bellii pusillus (nesting)	Least Bell's Vireo	Endangered	Endangered			LA, OR, RIV, SB, VEN
Vireo vicinior (nesting)	Gray Vireo	None	None	SC		SB
MAMMALS						
Antrozous pallidus	Pallid Bat	None	None	SC		IMP, OR, RIV, SB
Chaetodipus (=perognathus) fallax fallax	Northwestern San Diego Pocket Mouse	Species of Concern	None	SC		RIV, SB
Corynorhinus townsendii pallenscens	Pale Big-Eared Bat	Species of Concern	None	SC		IMP, RIV, SB
Dipodomys merriami parvus	San Bernardino Kangaroo Rat	Endangered	None	SC		SB
Dipodomys stephensi	Stephen's Kangaroo Rat	Endangered	Threatened			RIV, SB
Enhydra lutris nereis	Southern Sea Otter	Threatened	None			VEN

TABLE 3.3-4: SPECIAL STATUS SPECIES REPORTED IN THE SCAG REGION

Scientific Name	Common Name	Status				Counties Where Reported
		Federal	State	CDFG	CNPS/a/	
Eumops perotis californicus	California Mastiff Bat	Species of Concern	None	SC		IMP, OR, RIV, SB, VEN
Lepus californicus bennettii	San Diego Black-Tailed Jackrabbit	Species of Concern	None	SC		RIV
Macrotus californicus	California Leaf-Nosed Bat	Species of Concern	None	SC		IMP, SB
Myotis ciliolabrum	Small-Footed Myotis	Species of Concern	None	SC		SB
Myotis evotis	Long-Eared Myotis	Species of Concern	None			SB
Myotis thysanodes	Fringed Myotis	Species of Concern	None			RIV
Myotis velifer	Cave Myotis	Species of Concern	None	SC		RIV
Myotis volans	Long-Legged Myotis	Species of Concern	None			SB
Neotoma albigula venusta	Colorado Valley Woodrat	None	None			IMP, RIV, SB
Neotoma lepida intermedia	San Diego Desert Woodrat	Species of Concern	None	SC		LA, SB, VEN
Nyctinomops femorasaccus	Pocket Free-Tailed Bat	None	None	SC		RIV
Ovis canadensis cremnobates	Peninsular Bighorn Sheep	Endangered	Threatened			IMP, RIV
Ovis canadensis nelsoni	Nelson's Bighorn Sheep	None	None			IMP, LA, SB
Perognathus alticola alticola	White-Eared Pocket Mouse	Species of Concern	None	SC		SB
Perognathus inornatus inornatus	San Joaquin Pocket Mouse	Species of Concern	None			LA, VEN
Perognathus longimembris brevinasus	Los Angeles Pocket Mouse	Species of Concern	None	SC		RIV
Perognathus longimembris pacificus	Pacific Pocket Mouse	Endangered	None	SC		LA, OR
Sigmodon hispidus eremicus	Yuma Hispid Cotton Bat	Species of Concern	None	SC		IMP
Sorex ornatus willetti	Santa Catalina Shrew	Species of Concern	None	SC		LA
Spermophilus mohavensis	Mohave Ground Squirrel	Species of Concern	Threatened			LA, SB
Spermophilus tereticaudus chlorus	Coachella Valley Round-Tailed Ground Squirrel	Species of Concern	None	SC		RIV
Tamias panamintinus acrus	Kingston Mountain Chipmunk	None	None			SB
Urocyon littoralis	Island Fox	Species of Concern	Threatened			LA, VEN

/a/ California Native Plant Society: 1A = Plants Presumed Extinct in California; 1B = Plants Rare, Threatened, or Endangered in California and Elsewhere; 2 = Plants Rare, Threatened, or Endangered in Claifornia, But More Common Elsewhere; 3 = Plants About Which We Need More Information; 4 = Plants of Limited Distribution
SOURCE: CDFG. (1999). *Natural Diversity Database.* Sacramento, CA; U.S. Department of Fish and Wildlife. (1999-2003). *The Federal Register*. Washington D.C.

The Natural Heritage Division of CDFG identifies special status natural communities. These communities include both those that are naturally rare and those that have been greatly diminished through changes in land use. The CDFG tracks 135 special status natural communities in pursuit of their mandate to seek the long-term perpetuation of the areas in which these communities occur. In some cases, these areas have been established as protected reserves.

The CNDDB reports 45 special status natural communities in the six-county SCAG region. **Table 3.3-5**, below, presents these communities, and the counties in which they have been reported. These locations are shown on **Map 3.3-5** located in Chapter 8 (Maps).

Natural Lands

Natural lands are areas that are largely undeveloped and in their natural state. This type of open space is characterized by its biological resources and ecological functions. Natural lands generally are classified into three categories: cores, connectors, and fragments.

Cores are blocks of natural lands that are greater than 1,000 acres in area and have minimal edge-to-area ratio. Two types of connectors are identified: landscape and stepping stone linkages. Landscape linkages are contiguously connected lands that provide biotic connectivity between two or more cores; they typically are narrower than cores and have a higher edge-to-area ratio. Stepping stone linkages are natural lands that run between cores but are broken by small areas of development including major roads; they have a higher edge-to-area ratio than landscape linkages or cores. Some of the landscape linkages in the region have been further identified based on studies conducted as part of the statewide and Southern California Missing Linkages project and are identified separately as wildlife linkages and linkage design areas.

Wildlife linkages are regional landscape connectors that allow for animal movement and genetic flow necessary to maintain the ecological functions of larger ecosystems. Linkage design areas are wildlife linkages where a conservation strategy has been proposed to maintain a specific configuration of the linkage. The linkages identified in the statewide and regional studies are in locations where existing or proposed development limits options for maintaining and/or threatens to eliminate existing connections between cores. Fragments are patches of habitat smaller than 1,000 acres located either within one mile (satellite fragments), or further than one mile (isolated fragments) from a core.

Natural lands also are categorized as protected or unprotected. Protected lands are areas maintained in their natural state because they are in public ownership and designated for some level of conservation, are subject to easements or other agreements that preclude or limit conversion to other uses, or are subject to legal mandates that preclude their development. The level and type of protection vary widely, as do the allowed uses of the lands.

Unprotected lands are areas that are not subject to requirements or arrangements that would keep them in a natural state. Nearly 21 million acres in the region are considered natural lands. This estimate includes more than 20 million acres with various types of vegetation, about 500,000 acres of barren/disturbed lands, and 300,000 acres of water. This section describes the natural lands in terms of their land cover/vegetation types, biological values and ecological context, and ownership and protection status.

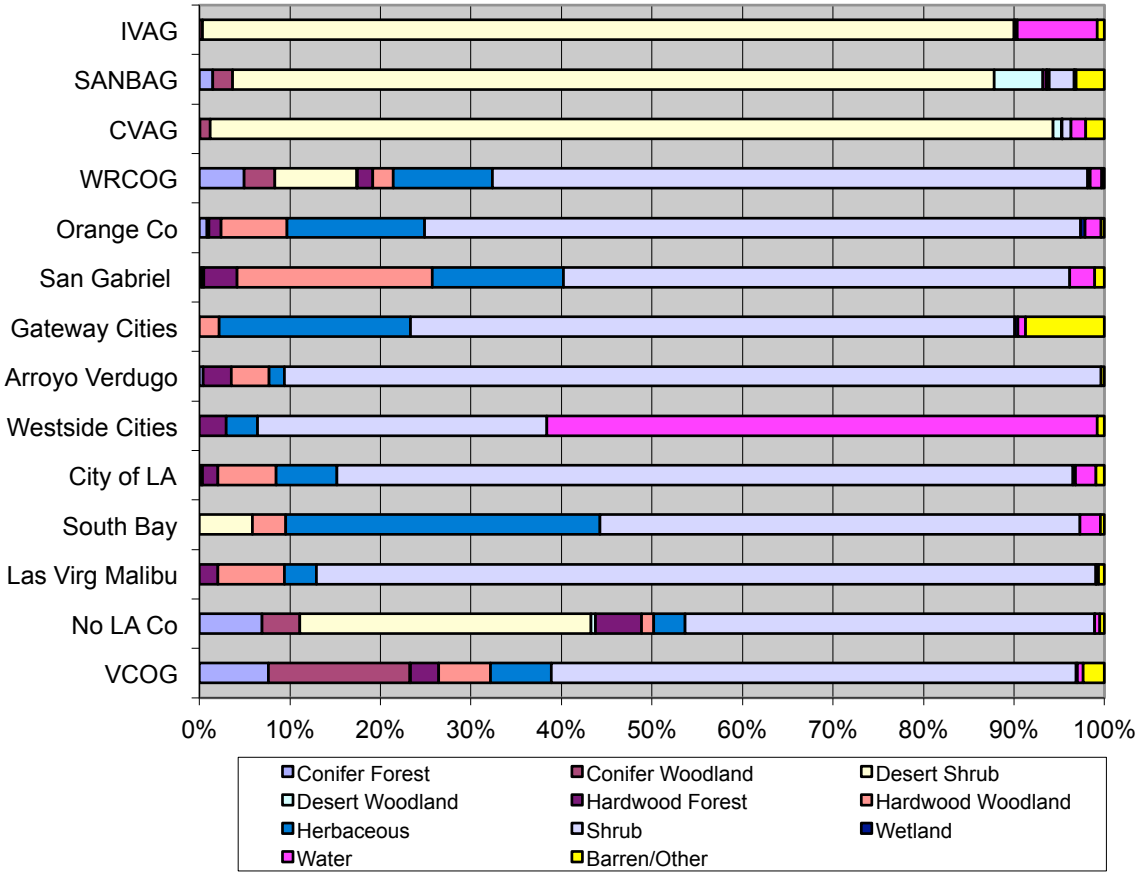
TABLE 3.3-5: SPECIAL STATUS COMMUNITIES REPORTED IN THE SCAG REGION

Natural Communities	Counties Where Reported
Active desert dunes	IMP
Alkali seep	SB
Amargosa river	SB
Arizonan woodland	SB
California walnut woodland	LA, SB, VEN
Canyon live oak forest	LA
Canyon live-oak ravine forest	RIV, SB, VEN
Cismontane alkali marsh	VEN
Coastal and valley freshwater marsh	RIV, SB, VEN
Crucifixion thorn woodland	IMP, SB
Desert fan palm oasis woodland	IMP, RIV, SB
Island cherry forest	LA
Mainland cherry forest	LA
Maritime succulent scrub	LA, VEN
Mesquite bosque	IMP, RIV, SB
Mojave mixed steppe	SB
Mojave riparian forest	LA, SB
Mojave yucca scrub and steppe	SB
Open engelmann oak woodland	LA
Pebble plains	SB
Riversidian alluvial fan sage scrub	LA, RIV, SB
Sonoran cottonwood willow riparian forest	IMP, RIV
Southern california arroyo chub/santa ana sucker stream	LA, OR, RIV, SB
Southern california coastal lagoon	LA, VEN
Southern california steelhead stream	LA, VEN
Southern california threespine stickleback stream	LA, SB, VEN
Southern coast live oak riparian forest	LA, OR, RIV, SB, VEN
Southern coastal bluff scrub	LA, VEN
Southern coastal salt marsh	LA, OR, VEN
Southern cottonwood willow riparian forest	LA, OR, RIV, SB, VEN
Southern dune scrub	LA, OR, VEN
Southern foredunes	LA, OR, VEN
Southern interior basalt flow vernal pool	RIV
Southern interior cypress forest	OR, RIV
Southern mixed riparian forest	LA, OR, RIV, SB, VEN
Southern riparian forest	LA, RIV, SB, VEN
Southern riparian scrub	LA, OR, RIV, SB, VEN
Southern sycamore alder riparian woodland	LA, OR, RIV, SB, VEN
Southern willow scrub	LA, OR, RIV, SB, VEN
Stabilized and partially stabilized desert dunes	IMP
Transmontane alkali march	IMP, SB
Valley needlegrass grassland	LA, OR, RIV, VEN
Valley oak woodland	LA, VEN
Walnut forest	LA, VEN
Wildflower field	LA

SOURCE: CDFG. (1999). *Natural Diversity Database*. Sacramento, CA; US. Department of Fish and Wildlife. (1999-2003). *The Federal Register.* Washington D.C.

The data compiled on land cover and vegetation types in the region are primarily from the Fire and Resource Assessment Program (FRAP) developed by the California Department of Forestry and Fire Protection and USDA Forest Service. **Figure 3.3-1** shows the proportion of natural lands in each subregion as of 2007; while amounts of lands may have changed somewhat since 2007, because of the slowdown in growth as a result of the Great Recession, it is anticipated that the relative proportions remain approximately the same.

Figure 3.3-1: Natural Lands in Each SCAG Subregion (Percentage Per Type)



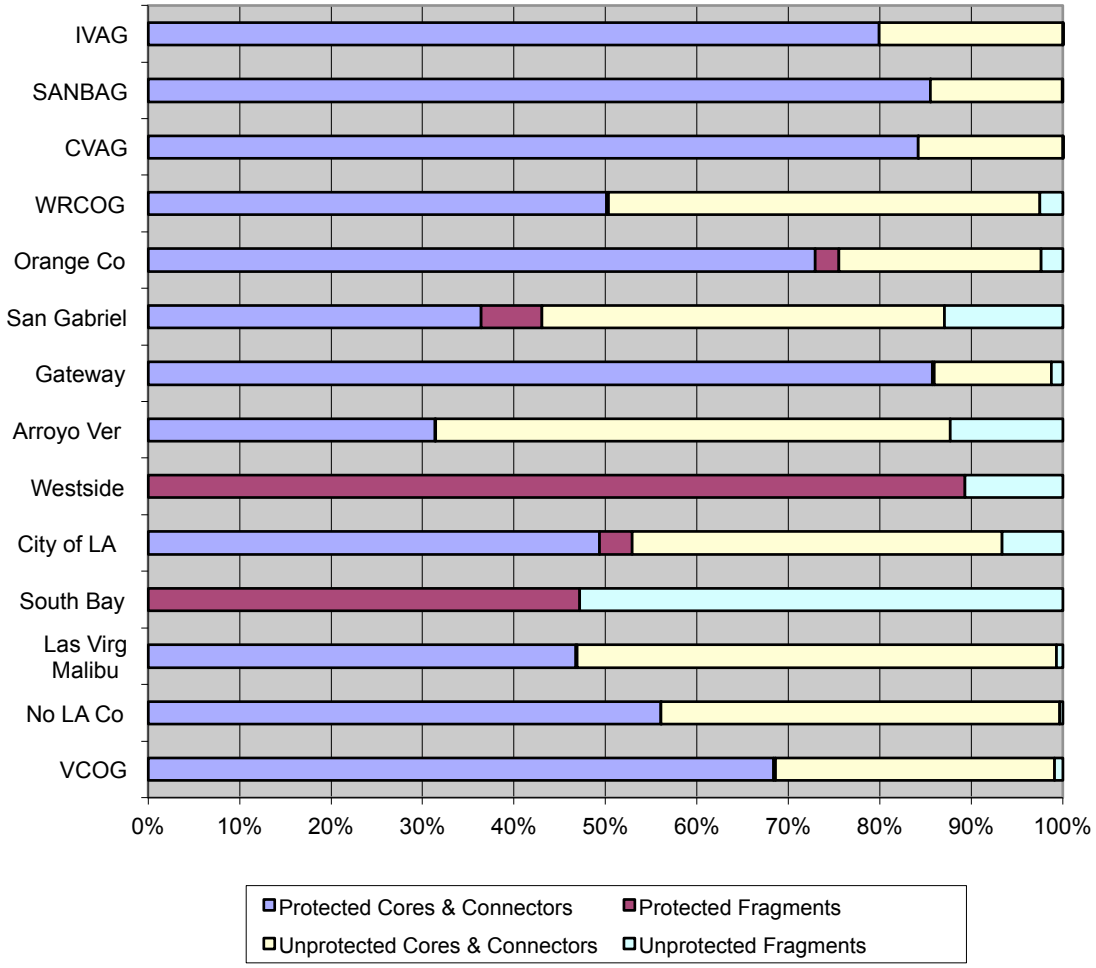
SOURCE: SCAG, 2007.

Figure 3.3-2 shows the proportion of natural lands in each subregion within the "protected" and "unprotected" categories as of 2007 (similar to Figure 3.3-1 numbers may have changed since 2007 but not substantially because of the Great Recession). Approximately 80 percent (more than 16 million acres) of natural lands in the SCAG region are in public ownership or in reserves. Nearly 90 percent of these lands occur in San Bernardino, Riverside, and Imperial Counties. Los Angeles County has nearly 900,000 acres of public natural lands, largely concentrated in its northern tier. Ventura County and western Riverside County each have more than 500,000 acres; Orange County has 130,000 acres.

Also concentrated in the eastern half of the region are the remaining 20 percent of lands that are in private ownership: 1.7 million acres in San Bernardino County, 950,000 acres in Riverside County, and 440,000 in Imperial County. Los Angeles County has 660,000 acres (mainly in the north), Ventura County has nearly 300,000 acres, and Orange County has about 40,000 acres.

Additional information about conservation efforts in the region is included in the bioregion chapters of the CDFG Wildlife Action Plan (WAP), the South Coast Missing Linkages reports, and CDFG's Natural Community Conservation Program (NCCP).

Figure 3.3-2: "Protected" and "Unprotected" Natural Lands in Each SCAG Subregion (percentage per category)



SOURCE: SCAG, 2007.

Threats to Biological Resources in the SCAG Region

Major threats to biological resources in the SCAG region include habitat loss, fragmentation and degradation, increased urbanization, water diversion projects, encroachment of non-native, invasive species, and other human activities, such as off-road vehicle activity.

Residential and agricultural development in the region has reduced open space and substantially limited the range of most of the natural communities. Natural habitat fragmentation caused by urbanization creates isolated "islands" of vegetation that may not provide sufficient area to support sustainable populations and can adversely impact genetic and species diversity. Habitat divided into islands, rather than continuous natural habitat, presents multiple problems to resident animals, including increased predation and direct mortality when attempting to move across developed areas, especially roads.[2]

[2]De Maynadier, P. G. & ML Hunter Jr., Road Effects on Amphibian Movements in a Forested Landscape. *Natural Areas Journal, 20(1)*, 56-65. January 2000.

Within California, approximately 95 percent of the State's historic wetlands have been converted to other land uses. An estimated 5 million acres of wetlands were present in California in the 1780s; by the 1980s the acreage of wetlands in California were reduced to only 450,000 acres.[3] The loss of wetlands has been more pronounced in the SCAG region, because of the intense development experienced by all wetlands along the South Coast, and the relative scarcity of surface waters.

Water management activities such as the operation of dams and diversions, development and operation of irrigation canal systems, and extraction of groundwater disrupt natural aquatic and riparian habitat. These types of habitat support diverse ecological communities, including many special status species. Alterations in freshwater flows result in the loss of natural riverine habitat, disruption of fish migration routes, and the loss of many native species.

The deliberate or accidental introduction of non-native plant species which can out compete native plant species for light, water, and soil results in habitat loss and degradation and creates unsuitable habitat for many native animal species. Changes to native habitat also bring altered fire regimes that can have unforeseen impacts on human settlements. Invasive animal and insect species can disrupt local ecosystems and bring diseases that native species have no defense against. Other wildlife stressors include excessive livestock grazing in sensitive plant communities, recreational pressures on wildlife habitat, and the loss and degradation of dune habitats through disruption of sand transport processes and inappropriate off-road vehicle use.[4]

Protection of Biological Resources in the SCAG Region

Table BIO-1, included in the technical appendix, presents a list of protected areas and agencies that administer the protected areas that provide large, un-fragmented natural habitats within the SCAG region. It should be noted that different ownership and designations of each area by the various agencies affords differing levels of protection. Some agencies protect the land for its natural value and recreational uses only, other agencies are more permissive in uses of the land, allowing activities such as grazing, forestry, or off-road vehicle use. A variety of regional planning efforts have been undertaken in the SCAG region to more efficiently and effectively achieve the purposes of the State and federal endangered species legislation. In addition to the traditional project-by-project approach to compliance, the federal Endangered Species Act includes a provision for permitting incidental take of listed species on private lands when a Habitat Conservation Plan (HCP) identifying the anticipated impacts of specific projects and implementing appropriate conservation measures is prepared and approved.

The Natural Community Conservation Planning Program (NCCP), established by the California Resources Agency under the Natural Community Conservation Planning Act of 1991, is a voluntary, collaborative effort between local landowners, jurisdictions and the State of California. The program provides protection and identifies mitigation areas to offset future impacts to coastal scrub habitat and conserve the California gnatcatcher. The NCCP pilot program area encompasses 3,840,000 acres (6,000 square miles), including portions of Riverside, Los Angeles, Orange, and San Bernardino Counties. Each county has one or more subregional planning areas.[5] In recent years, NCCPs have extended beyond the boundaries of the original pilot area into Imperial County, the rest of Riverside County, and other parts of the State. **Table 3.3-6** provides the status of NCCP programs in the SCAG region.

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[3]Dahl, T.E (1990). *Wetlands losses in the United States 1780's to 1980's*. U.S. Department of the Interior, Fish and Wildlife Service, Washington DC. 13pp, available at: http://www.fws.gov/wetlands/_documents/gSandT/NationalReports/WetlandsLossesUS1780sto1980s.pdf, accessed August 10, 2011.

[4]California Department of Fish and Game (2007), *California Wildlife: Conservation Challenges*, available at: http://www.dfg.ca.gov/wildlife/WAP/docs/report/ch3-threats.pdf, accessed August 6, 2011.

[5]CDFG, *Southern California Coastal Sage Scrub NCCP Conservation Guidelines,* available at: www.nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=15550, accessed August 6, 2011.

TABLE 3.3-6: NATURAL COMMUNITIES CONSERVATION PLANS

County	Plan	Lead Agency	Planning Area Covered (acres)	Area set aside for reserve/preserve (acres)	Plan Status
Imperial	Imperial Valley Natural Community Conservation Plan and Habitat Conservation Plan	Imperial Irrigation District	500,000	Under development	Developing Draft Plan. NCCP agreement signed February 2006.
Los Angeles	Palos Verdes Peninsula Subregional Plan	City of Rancho Palos Verdes	8,661	1,507	Final Plan approved August 2004 by City Council. Awaiting permits.
Orange	Orange County Central-Coastal NCCP/HCP Subregional Plan	Orange County	208,000	37,380	Permits Issued July 1996.
Orange	Orange County Southern Subregion HCP/a/	Orange County	132,000	32,818	Permits issued January 2007.
Riverside	Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP)	Coachella Valley Association of Governments	1,100,000	745,900	Permits Issued September 2008.
Riverside	Western Riverside County Multiple Species Habitat Conservation Plan	Riverside County	1.2 million	500,000	Permits issued June 2004.

/a/ Plan is a combination HCP, special area management plan, and master streambed alteration agreement. Final plan does not meet NCCP standards and any state listed species take will be permitted under California Endangered Species Act.
SOURCE: CDFG website, available at: http://www.dfg.ca.gov/habcon/nccp/status/index.html, accessed August 15, 2011; U.S. Fish and Wildlife Service website, available at: http://www.fws.gov/carlsbad/HCPs/FAQ%20Orange%20County%20Southern%20Subregion %20HCPsjw%20web.pdf, accessed August 15, 2011.

THRESHOLDS OF SIGNIFICANCE

Based on CEQA Guidelines Appendix G and as appropriate for the 2012-2035 RTP/SCS, the Plan would have a significant impact related to biological resources and open space if it would:

- Have a substantial adverse effect, either directly or through habitat modification, 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;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native residents or migratory wildlife corridors or impeded the use of native wildlife nursery sites;
- Conflict with any local polices or ordinance protecting biological resources, such as a tree preservation policy or ordinance; and/or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other adopted local, regional, or State habitat conservation plan.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the 2012-2035 RTP/SCS on biological and open space resources in the SCAG region. The 2012-2035 RTP/SCS's transportation projects and growth projections for the year 2035 are regional, cumulative, and long-term in nature, and provide a conservative estimate of potential environmental impacts.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of biological and open space resources includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan were adopted (No Project). This evaluation is not included in the determination of the significance of impacts (which is based on a comparison to existing conditions); however, it provides a meaningful perspective on the effects of the 2012-2035 RTP/SCS.

Determination of Significance

The impact assessment for biological resources and open space focuses on the potentially significant effects of the Plan on biological and open space resources contained within the SCAG region. The methodology for determining the significance of these impacts compares a regional-level analysis of the future Plan conditions to existing biological and open space resources.

To assess potential impacts to biological resources and open space, Geographic Information Systems (GIS) was used to identify where 2012-2035 RTP/SCS major freeway, rail, and transit projects would be near biological resources or open space and, therefore, be likely to cause a potential impact. Specifically, using GIS spatial data, potential regional-level adverse effects were identified by overlaying 2012-2035 RTP/SCS projects upon the distribution and locations of known biological and open space resources, including natural vegetation, wetlands and water resources, special status species and communities, natural lands, and agricultural lands. The methodology for determining the significance of these impacts compares the future Plan conditions to the existing setting.

The impacts-analysis identifies a direct intersection between Plan projects and existing biological and open space resources, and identifies the potential cumulative impact of the transportation projects and associated growth on habitat loss, degradation, and fragmentation. The analysis also includes a review of adopted habitat conservation plans to identify potential conflicts with their provisions.

The development of the SCS included a substantial effort to identify resource areas and to avoid locating future development in more areas. In doing so, the Plan generally reduces the potential for disturbance of biological resources.

Implementation of the 2012-2035 RTP/SCS would affect biological resources and open space. Expected significant impacts include disturbance and removal of natural vegetation that may be utilized by sensitive species, habitat fragmentation and the associated decrease in habitat quality, litter, trampling, light pollution and road noise in previously undisturbed natural areas, displacement of riparian and wetland habitat, siltation of streams and other water bodies during construction, and the loss of prime farmlands, grazing lands, open space and recreation lands. The increased urban development anticipated by the Plan would result in similar cumulative impacts.

Two basic types of impacts would potentially occur from transportation projects identified in the 2012-2035 RTP/SCS and anticipated growth. These include short-term construction related impacts, and long-term or permanent displacement as well as any potential off-site impacts from new facilities.

This PEIR analyzes these impacts on biological resources and open space on a program level only. Project-level analysis of impacts will also be necessary. For example, whenever a project is located near biological resources of concern or within habitats capable of supporting such resources, a biological resources evaluation will need to be conducted and project-specific impacts with appropriate feasible mitigation measures identified.

IMPACTS

Impact 3.3-1: Potential to develop previously undisturbed land and displace natural vegetation, and thus habitat, which includes sensitive species habitat.

The significance of this impact would relate to the extent, and type, of natural vegetation displaced. In general all areas of natural vegetation contain potentially significant biological value.

Impacts to sensitive species would not be expected to be limited to those mapped by the CNDDB (**Map 3.3-1** located in Chapter 8 (Maps)). The CNDDB system relies on reported sightings of sensitive species, and it is not a complete inventory of sensitive species habitat. For example, the Mixed Flow Improvement along Highway 395 that would be located in sensitive animal species habitat could result in a direct loss of habitat. Similarly, the High Quality Transit Area (HQTA) along the I-15 in Riverside County corresponds to known locations of listed animal and plant sensitive species. Although specific projects are not as yet identified for the HQTAs, development would be targeted in these areas. Therefore, it is possible that direct impacts could occur due to development within the HQTA, or indirect impacts could occur if habitat was encroached upon to the extent that it could no longer support species. However, HQTAs generally aim to encourage compact development that consumes less land, and therefore, less habitat than traditional development. Nonetheless, impacts would be expected to occur. The site-specific significance of projects would include the relative scarcity and importance to other valuable biological resources. Additionally, the nature of the site-specific project would affect the size of the disruption. The addition of a traffic lane would be expected to cause less disruption than an entirely new road, for example.

The 2012-2035 RTP/SCS would substantially affect vegetation communities and habitat, some of which is utilized by special status species. Implementation of Mitigation Measures **BIO/OS1** through **BIO/OS35**, **BIO/OS44** through **BIO/OS46**, **BIO/OS49**, **BIO/OS51** through **BIO/OS53**, and **BIO/OS55** through **BIO/OS59** would reduce habitat displacement impacts; however, impacts would remain significant.

Impact 3.3-2: Potential to contribute to the fragmentation of existing habitat, decreasing habitat sizes, reducing habitat connectivity, and causing direct injury to wildlife. The 2012-2035 RTP/SCS includes new transportation corridors and development that may form barriers to animal migration and/or foraging routes.

Wildlife-roadway interactions often injure or kill wildlife. Road building and widening results in barriers between existing habitat areas in the SCAG region. This serves to isolate habitats and divide them into smaller and smaller areas thereby reducing the quality of the habitats, especially for species with large home ranges.[6] Similar impacts would occur as a result of development both in urban areas where habitat fragments exist within largely urban areas (such as parks and hillside areas) and in parts of the region that are currently undeveloped but would be developed as a result of the Plan. The intensity of the effect would be dependent on the size and quality of the habitat impacted by each individual project and the ability of the project to provide specific mitigation for its impacts.

Where development results in a barrier, such disturbances can lead to further ecological disruptions including disruption of prey-predator interactions and species alterations. The linear nature of transportation projects increases the potential extent and significance of this effect. Where entirely new roadways and rail lines would be constructed, there would be a high potential for a significant barrier effect. Conversely, where the project involves only an addition of lanes to an existing roadway, the barrier impact would likely not be significant because the existing roadway has already formed a barrier and the new lanes would incrementally increase the existing barrier effect.

The anticipated growth pattern associated with the Plan would consume less land that a more dispersed pattern, but as discussed under Impact 3.3-2, the potential remains for development associated with the Plan to contribute to the fragmentation of existing habitat. As with transportation projects, the degree of the impact would depend on the quality of the habitat, the amount of planned development, and the ability to mitigate on a case-by-case basis. Impacts in urban areas (including in HQTAs) could be more severe because even impacts to a small amount of open space tends to impact a high percentage of open space in that area.

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[6]Frankham, R., J.D. Ballou and D.A. Briscoe, (2002). *Introduction to conservation genetics*. Cambridge University Press. Cambridge, MA.

Additional indirect impacts would be expected to occur as a result of the 2012-2035 RTP/SCS. For example, in areas where development would occur near existing habitat, the introduction of human elements such as dogs and cats could result in further loss of wildlife through hunting. Implementation of Mitigation Measures **BIO/OS36** through **BIO/OS40** would reduce habitat fragmentation impacts; however, impacts would remain significant.

Impact 3.3-3: Potential to increase near-road human disturbances such as litter, trampling, light pollution, and road noise in previously relatively inaccessible and undisturbed natural areas.

Many wild animals are negatively affected by human disturbance and will avoid or vacate areas where human activities have become prevalent. Such losses might shift species abundance favoring more tolerant species over more sensitive species near well-used roadways. Often the more tolerant species is a non-native pest species and the species that vacate are more desirable native species. In some cases, the animals affected are of special concern.

As discussed above, the Plan includes entirely new roadways, such as the High Desert Corridor and therefore, will newly expose biological resources and open space to human disturbances. Site-specific analyses of alternative alignments/locations are necessary as projects are developed. As development occurs under the 2012-2035 RTP/SCS, additional urban features could be added to non-urban areas. Although more than half of the anticipated development would occur in HQTAs that have existing infrastructure and are urbanized, some development would occur in undisturbed natural areas. The Plan would consume 334 square miles (213,800 acres) of previously undisturbed land. Due to the number of projects included in the 2012-2035 RTP/SCS and anticipated land consumption from development project impacts would be significant.

Implementation of Mitigation Measures **BIO/OS41** and **BIO/OS42** would reduce near-road human disturbance impacts; however, impacts would remain significant.

Impact 3.3-4: Potential to damage natural vegetation and other habitat components as a result of trampling or off-road machinery during construction activities. Direct fatalities to wildlife would also potentially occur.

Trampling or driving over areas with native vegetation can not only destroy existing vegetation and cause short-term disruptions to associated wildlife uses, but it can also result in soil hardening. Soil hardening often causes a longer-term change in species composition, with non-native invasive species often displacing more valuable native vegetation. Without mitigation, construction equipment has the potential to directly kill wildlife.

Construction activities are more likely to have significant effects with greater duration if occurring over a large area of natural vegetation. These effects are also more likely to be significant when the disruption affects habitat of special status species. Soil hardening and vegetation losses can also increase erosion, causing the siltation effects. Timing of the activity would also be important in situations where a critical life stage of an animal is affected (e.g., bird nesting).

Implementation of Mitigation Measures **BIO/OS7**, **BIO/OS8**, **BIO/OS 10, BIO/OS12**, and **BIO/OS13** would reduce construction related natural vegetation trampling impacts; however, impacts would remain significant.

Impact 3.3-5: Potential to create noise, smoke, lights and/or other disturbances to biological resources during construction and operation of projects.

Construction activities have the potential to negatively affect animal behavior that may result in harm to an individual or population (e.g., causing a nesting failure of a sensitive bird). If the animal is a special status species, and the effect is likely, the potential for a significant impact is increased.

Operation of projects included in the Plan would have the potential to disturb biological resources. Projects such as HST, LOSSAN, and light rail would all generate noise and light that could affect biological resources. Similarly goods movement projects such as truckways could also result in noise, light or other disturbances that would affect biological resources. Development would introduce new human elements such as nighttime lighting and noise that could also affect previously undisturbed areas. Implementation of Mitigation Measures **BIO/OS7** through **BIO/OS9**, **BIO/OS12**, **BIO/OS13**, and **BIO/OS43** would reduce construction related impacts; however, due to the substantial amount of construction that would occur with implementation of the Plan, impacts would remain significant.

Impact 3.3-6: Potential to displace riparian or wetland habitat.

The significance of this impact would depend on the amount and kind of habitat removed and the ability of individual projects to mitigate their impact. Removal of large riparian trees, for example, can reduce stream shading and increase temperatures. Removal of riparian shrubs or grasses can increase erosion and cause siltation impacts discussed below. Removal of aquatic vegetation such as rushes, cattails, or sedges can remove valuable aquatic food sources, spawning or cover habitat, and decrease the water resource's ability to recycle nutrients.

Lane additions achieved through re-striping would have less or no impact compared to lane additions and new roadways. Potential wetland impacts from the 2012-2035 RTP/SCS projects, including future toll facilities in northern Los Angeles County that also pose an impact as they head east into central western San Bernardino County. Further, development that would occur as a result of implementation of the Plan would also have the potential to result in the loss of riparian habitat. However, the majority of the development under the Plan would be in urbanized areas that do not have substantial amounts of valuable habitat. Nonetheless, due to the large number of projects that would be implemented as a result of, the 2012-2035 RTP/SCS, and the large area affected by development (consumption of 334 square miles), it is anticipated that the Plan would substantially affect riparian and wetland habitat. Implementation of Mitigation Measures **BIO/OS11** through **BIO/OS19** would reduce riparian and wetland habitat displacement impacts; however, impacts would remain significant.

Impact 3.3-7: Potential to increase siltation of streams and other water resources from exposures of erodible soils during construction activities.

Excessive siltation can significantly degrade habitat for fish and other aquatic organisms. Heavy sediment deposition can bury slow-moving or sessile bottom-dwelling organisms, fish eggs, and larval forms of many aquatic organisms. These losses are not only of direct concern, but also represent a loss of food sources for larger fishes and other organisms, such as birds and mammals, that are not directly affected by sediments. Increased sediment can also decrease light penetration for aquatic plant production and increase water temperature from greater insulation. Higher water temperatures can affect aquatic organisms through direct stress of temperature-sensitive organisms (e.g., steelhead require cold water streams), and by increasing nitrate productivity that can exacerbate eutrophication if the sediments contain or are accompanied by excessive nutrients (i.e., algal blooms).

The degree of this impact would depend on several factors including the following:

- *Length of occurrence.* The longer the period of sedimentation, the greater the potential for significance.
- *Timing of occurrence*. The effect would be of greater significance during particularly sensitive times of year, such as during fish spawning seasons when the eggs and larvae which are particularly sensitive to siltation would be present; and,
- *Significance of Resource.* The effect would be of greater significance where a special status species might be affected, such as near a steelhead spawning stream.

As discussed above, the 2012-2035 RTP/SCS includes transportation project and development that would require substantial construction activities. It is likely that some of this construction would occur in areas near streams or other water resources resulting in potential impacts. Implementation of Mitigation Measure **BIO/OS50** would reduce siltation impacts; however, impacts would remain significant.

Impact 3.3-8: Conflict with any provisions of an adopted Habitat Conservation Plan or Natural Community Conservation Plan (NCCP).

Planned projects in Riverside County are included as "Covered Activities" in the adopted Riverside County Multiple Species Habitat Conservation Plan. The adopted Natural Community Conservation Plans in Orange County is not in conflict with any of the projects included in the 2012-2035 RTP/SCS, nor would development be anticipated in protected conservation planning areas in general. No other impacts to HCPs or NCCPs are anticipated. Impacts would be less than significant.

Impact 3.3-9: Substantial disturbance and/or loss of open space and rangelands used for foraging.

Implementation of the 2012-2035 RTP/SCS could result in long-term impacts to open space and rangelands in the region that are used by birds and animals for foraging. Rangelands and open spaces in the SCAG region are interspersed throughout urban areas and are also located in less developed portions of the counties. Where there would be new development outside of the urbanized areas, undisturbed/vacant land could be utilized for transportation projects and development. Those lands may have historically been farmed or may currently be used for agriculture. Some lands may be planned for Multi Species Habitat Conservation Plans (MSHCP) or Natural Community Conservation Program (NCCP) open space preserves. Depending upon the characteristics of the surrounding preserves, the underlying soils and the particular roadway improvements or development, there may be impacts to species that use such lands for foraging including a number of bird species.

Transit improvements included in the 2012-2035 RTP/SCS are generally located in urbanized areas and, therefore, are more likely to impact smaller-scale open spaces or parks, although in general, because of the scarcity of parks in urban areas of the SCAG region, impacts to parks are generally avoided to the maximum extent feasible.

Several types of projects identified in the 2012-2035 RTP/SCS would have the potential to create significant impacts to open spaces and rangelands, such as the Mixed Flow and High Occupancy Vehicle (HOV) lane improvements in central western Riverside County along the I-215. Also the Mixed Flow and HOV improvements along the I-15 and I-215 in southwestern San Bernardino County. Proposed projects that could result in a significant impact include construction of roadway improvements, such as grade separated facilities for busways, goods movement roadway facilities, and HOV connectors in areas that currently serve as agricultural lands. Additional rangelands would be affected by the growth associated with the 2012-2035 RTP/SCS.

Additional impacts could occur in urban areas, such as HQTAs where development will be targeted. In these areas, densification of the HQTA may result in the conversion of open space to urban uses. Implementation of Mitigation Measures **BIO/OS46** through **BIO/OS49 and BIO/OS54** would reduce open space/rangelands impacts; however, impacts would remain significant.

Cumulative Impacts 3.3-10: Potential to contribute to a cumulatively considerable loss of habitat and biological resources.

Under the 2012-2035 RTP/SCS habitat fragmentation and loss as well as disturbance would occur. Many of these impacts would be the direct result of either transportation improvements or development. Loss of habitat as well as habitat fragmentation would contribute to statewide impacts to protected species. Many important habitat corridors cross the SCAG region's boundaries. As a result, the loss of an important corridor, or fragmentation of habitat in the SCAG region could limit the movement of wildlife species resulting in additional cumulative impacts. Similarly, fragmentation could reduce the viability of a species beyond the SCAG region. Therefore, the 2012-2035 RTP/SCS would contribute to a cumulative biological resources impact. Implementation of Mitigation Measures **BIO/OS1** through **BIO/OS59** would reduce cumulative impacts; however, impacts would remain significant.

MITIGATION MEASURES

Mitigation Measures **MM-BIO/OS1** through **MM-BIO/OS43** and Mitigation Measures **MM-BIO/OS47** through **MM-BIO/OS59** can and should be implemented by project sponsors (for both development and transportation projects) as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions. Mitigation Measures **MM-BIO/OS44** through **MM-BIO/OS46** shall be implemented by SCAG over the lifetime of the 2012-2035 RTP/SCS.

Ecosystems in the SCAG Region

MM-BIO/OS1: Project sponsors can and should assess displacement of habitat due to removal of native vegetation during route planning/project location planning. Routes/project sites can and should be planned in coordination with state and local resources agencies and should consider inventories of natural resources, such as CDFG and CNDDB. Routes can and should be planned in order to avoid and/or minimize removal of native vegetation, by comparing proposed infrastructure with state and local conservation plans and by creating maps of resource habitat overlaid with the transportation network. Projects located in or adjacent to habitat areas can and should incorporate buffers to minimize lighting, noise, and other project impacts that can severely disrupt wildlife. Vegetation buffers can and should be appropriate to the adjacent vegetation association and protect the genetic integrity of the adjacent habitat. If avoidance is not possible, agencies/project sponsors can and should consult with the appropriate resource agencies to develop mitigation activities.

MM-BIO/OS2: When avoidance of native vegetation removal is not possible, project sponsors can and should replant disturbed areas with commensurate native vegetation of high habitat value adjacent to the project (i.e., as opposed to ornamental vegetation with relatively less habitat value). When possible, habitat rehabilitation can and should use recycled material from rehabilitated infrastructure.

MM-BIO/OS3: Project sponsors can and should include on-site habitat enhancement as a first priority and offsite habitat enhancement or restoration to compensate for unavoidable habitat losses from each project site as appropriate and necessary.

Special Status Species and Natural Communities

MM-BIO/OS4: Pre-construction special status species surveys can and should be conducted by a qualified biologist to verify presence or absence of species at risk. Species surveys can and should occur during the portion of the species' life cycle where the species is most likely to be identified within the appropriate habitat. In all cases, impacts on special status species and/or their habitat can and should be avoided during construction to the maximum extent feasible.

MM-BIO/OS5: For projects located in sensitive habitat areas, project sponsors can and should develop and implement a Worker Awareness Program (environmental education) to inform project workers of their responsibilities in regards to avoiding and minimizing impacts on sensitive biological resources.

MM-BIO/OS6: Project sponsors can and should appoint an Environmental Inspector to serve as a contact for issues that may arise concerning implementation of mitigation measures, and to document and report on adherence to these measures.

MM-BIO/OS7: Project sponsors can and should schedule construction activities to avoid sensitive times for biological resources (e.g. steelhead spawning periods during the winter and spring) and to avoid the rainy season when erosion and sediment transport is increased.

MM-BIO/OS 8: Project sponsors can and should schedule projects to avoid construction during critical life stages or sensitive seasons (e.g. the nesting season; see **MM-BIO/OS25**, and **MM-BIO/OS15** through **MM-BIO/OS35**).

MM-BIO/OS9: Project sponsors can and should precede construction, as appropriate, by pre-construction monitoring to ensure no sensitive species' habitat would be unnecessarily destroyed (also see **MM-BIO/OS4** through **MM-BIO/OS13**). All discovered sensitive species habitat can and should be avoided where feasible, or disturbance should be minimized.

MM-BIO/OS10: Project sponsors can and should fence and/or mark sensitive habitat to prevent unnecessary machinery or foot traffic during construction activities.

MM-BIO/OS11: Project sponsors can and should ensure that sensitive habitats (native vegetative communities identified as rare and/or sensitive by the CDFG) and special-status plant species (including vernal pools) impacted by projects can and should be restored and augmented, if impacts are temporary, at a 1:1 ratio (compensation acres to impacted acres). Permanent impacts can and should be compensated for by creating or restoring habitats at a 3:1 ratio as close as possible to the site of the impact. The CDFG may recommend mitigation ratios that vary on a project-by-project basis and may exceed those recommended in **MM-BIO/OS17**.

MM-BIO/OS12: When work is conducted in or adjacent to identified sensitive habitat areas, and/or areas of intact native vegetation, construction protocols can and should require the salvage of perennial plants and the salvage and stockpile of topsoil (the surface material from 6 to 12 inches deep) and can and should be used in restoring native vegetation to all areas of temporary disturbance within the project area.

MM-BIO/OS13: When removal and/or damage to sensitive species habitat are unavoidable during construction, project sponsors can and should ensure that any disturbed natural areas are replanted with appropriate native vegetation following the completion of construction activities. In the case of permanent losses to sensitive species habitat, mitigation can and should follow the offsite habitat compensation guidance.

MM-BIO/OS14: A qualified wetland scientist can and should review construction drawings as part of each project-specific environmental analysis to determine whether wetlands will be impacted, and if necessary, perform a formal wetland delineation. Appropriate state and federal permits can and should be obtained, but each project EIR will contain language clearly stating the provisions of such permits, including avoidance measures, restoration procedures, and in the case of permanent impacts compensatory creation or enhancement measures to ensure a no net loss of wetland extent or function and values.

MM-BIO/OS15: Suitable habitat for listed vernal pool crustaceans can and should be avoided to the extent feasible. If infeasible, impacts should be mitigated in accordance with the Programmatic Biological Opinion (PBO) for vernal pool invertebrates, issued by the USFWS Sacramento Field Office in 1995. Surveys should be conducted, with USFWS approval, in accordance with the 1996 *Interim Survey Guidelines to Permittees for Recovery Permits under* Section 10(a)(1)(A) *of the Endangered Species Act for the Listed Vernal Pool Branchiopods,* to establish whether or not listed invertebrates are present.

MM-BIO/OS16: Project sponsors can and should avoid removal of wetland or riparian vegetation. Specific vegetation that is not to be removed should be so marked during construction. Wetland and riparian vegetation removal should be minimized as much as possible.

MM-BIO/OS17: Project sponsors can and should replace any disturbed wetland, riparian or aquatic habitat, either on-site or at a suitable off-site location at ratios to ensure no net loss. See **MM-BIO/OS1** through **MM-BIO/OS14**.

MM-BIO/OS18: Project sponsors can and should ensure that when individual projects include unavoidable losses of riparian or aquatic habitat, adjacent or nearby riparian or aquatic habitat should be enhanced (e.g., through removal of non-native invasive wetland species and replacement with more ecologically valuable native species).

MM-BIO/OS19: For projects near water resources project sponsors can and should implement Best Management Practices (BMPs) at construction sites to minimize erosion and sediment transport from the area. BMPs include encouraging growth of vegetation in disturbed areas, using straw bales or other silt-catching devices, and using settling basins to minimize soil transport. (See also Water Resources Mitigation Measures.)

Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of 3:1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS.

MM-BIO/OS20: If specific project area trees are designated as "Landmark Trees" or "Heritage Trees", then approval for removals can and should be obtained through the appropriate entity, and appropriate mitigation measures can and should be developed at that time, to ensure that the trees are replaced. Mitigation trees can and should be locally-collected native species.

MM-BIO/OS21: Retention of trees on-site can and should be prioritized consistent with local regulations. Adequate protection can and should be provided during the construction period for any trees that are to remain standing, including the following, plus any recommendations of an arborist:

a. Before the start of any clearing, excavation, construction or other work on the site, every protected tree deemed to be potentially endangered by said site work, can and should be securely fenced off. Such fences can and should remain in place for duration of all such work. All trees to be removed can and should be clearly marked. A scheme can and should be established for the removal and disposal of logs, brush, earth and other debris that will avoid injury to any protected tree.
b. Where proposed development or other site work could encroach upon the protected perimeter of any protected tree, special measures can and should be incorporated to allow the roots to breathe and obtain water and nutrients. Any excavation, cutting, filing, or compaction of the existing ground surface within the protected perimeter should be minimized. No change in existing ground level should occur from the base of any protected tree at any time. No burning or use of equipment with an open flame should occur near or within the protected perimeter of any protected tree.
c. No storage or dumping of oil, gas, chemicals, or other substances that may be harmful to trees should occur from the base of any protected trees, or any other location on the site from which such substances might enter the protected perimeter. No heavy construction equipment or construction materials should be operated or stored within a distance from the base of any protected trees. Wires, ropes, or other devices should not be attached to any protected tree, except as needed for support of the tree. No sign, other than a tag showing the botanical classification, should be attached to any protected tree.
d. Periodically during construction, the leaves of protected trees can and should be thoroughly sprayed with water to prevent buildup of dust and other pollution that would inhibit leaf transpiration.
e. If any damage to a protected tree should occur during or as a result of work on the site, the project sponsor can and should immediately notify the appropriate local agency of such damage. If, such tree cannot be preserved in a healthy state, the local agency can and should require replacement of any tree removed with another tree or trees on the same site deemed adequate by the local agency to compensate for the loss of the tree that is removed.
f. All debris created as a result of any tree removal work can and should be removed by the project sponsor from the property within two weeks of debris creation, and such debris can and should be properly disposed of by the project sponsor in accordance with all applicable laws, ordinances, and regulations.

MM-BIO/OS22: Project sponsors with projects within the range and within suitable habitat for species listed as threatened or endangered under California Endangered Species Act (such as the Mohave ground squirrel) or the Federal Endangered Species Act (such as the Arroyo toad) can and should conduct surveys, with CDFG and/or USFWS approval, in accordance with established and approved survey methods appropriate for the species of interest, such as the 1999 USFWS *Survey Protocol for the Arroyo Toad,* to establish whether or not the species is present. If species is determined present then the following applies:

- A pre-construction survey shall be conducted by a qualified biologist at each site to identify suitable habitat for the species of interest and to determine what avoidance measures, including relocation, fencing installation, and avoidance of breeding season will be required.
- Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of 3:1 (compensation acres to that impacted)) or other similar ratio with the approval of the USFWS and/or CDFG).

- Project sponsors must obtain an Incidental Take Permit under Section 2081 of the Fish and Game Code before proceeding with authorization of any project subject to CESA. Additional authorization may be required by the USFWS for take of federal-listed species or their occupied habitat.

MM-BIO/OS23: Project sponsors with projects within the range and within suitable habitat for the blunt-nosed leopard lizard can and should conduct surveys, with USFWS approval, in accordance with the 2004 CDFG *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard,* to establish whether or not the species is present. If species is determined present then the following applies: Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of 3:1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG). No direct taking of the blunt-nosed leopard lizard should occur as this is a CDFG fully protected species with no regulatory mechanism to authorize direct taking (killing) of individuals.

MM-BIO/OS24: Project sponsors with projects within the range and within suitable habitat for the California red-legged frog can and should implement the measures detailed in the Programmatic Biological Opinion (PBO) for construction impacts to the red-legged frog that was issued by the USFWS (Federal Register 1999) to the USACE. The measures listed below are taken largely from the PBO and, if applied to the western pond turtle as well as the frog, would be adequate as standard mitigation for both species. A similar level of effort for survey protocol can also be applied to the Mountain yellow-legged frog, with adjustments to its climate, habitat, and breeding requirements.

- The name and credentials of a biologist qualified to act as a construction monitor will be submitted to USFWS for approval at least 15 days prior to commencement of work;
- The USFWS-approved biologist can and should survey the site two weeks prior to the onset of work activities and immediately prior to commencing work. If red-legged frog adults, tadpoles, or eggs are found, the approved biologist can and should contact USFWS to determine whether relocating any life stages is appropriate;
- The USFWS-approved biologist can and should ensure that the introduction or spread of invasive exotic plant species is avoided to the maximum extent possible, by removing weeds from areas of exposed bare soil within the construction zone where construction occurs in riparian vegetation.
- The number and size of access routes, staging areas, and total area of activity should be limited to the minimum necessary to achieve the project goal;
- If work sites require dewatering, the intakes can and should be screened with a maximum mesh sizes of 5 millimeters;
- The USFWS-approved biologist can and should permanently remove and destroy from within the project area any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent practicable.

MM-BIO/OS25: Project sponsors with projects within the range and within suitable habitat for the California tiger salamander can and should conduct surveys, with USFWS approval, in accordance with the 2003 USFWS *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander,* to establish whether or not the species is present. In addition to measures described for the California red-legged frog, which would also serve to protect the California tiger salamander, the following measures can and should be implemented to further minimize adverse effects to the California tiger salamander.

- A pre-construction survey can and should be conducted at each site to identify suitable pond and upland burrow aestivation areas. As feasible within the context of the work area, aestivation areas should be temporarily fenced and avoided.
- At locations where upland aestivation habitat is identified and cannot be avoided, aestivation burrows can and should be excavated by hand prior to construction and individual animals moved to natural burrows or artificial burrows constructed of PVC pipe within 0.25 miles of the construction site as approved by the USFWS.
- To ensure compliance with these measures and minimize California tiger salamander take, a qualified biological monitor can and should be present during all new site disturbance construction activities (vegetation removal, clearing, grubbing, grading) at locations with suitable upland aestivation habitat.
- Impacts on breeding ponds can and should be avoided until the ponds have dried.
- Upon approval by the USFWS, preconstruction surveys to salvage and relocate individual California tiger salamanders can and should include installation of drift fences and pitfall traps within construction sites to identify and relocate animals. Following removal of individuals, construction areas should be fenced with temporary exclusionary silt fencing.
- Temporary impacts on upland aestivation habitat can and should be restored to grassland habitat.
- Mitigation for occupied habitat permanently impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of 3:1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG).

MM-BIO/OS26: Project sponsors with projects within the range and within suitable habitat for the Coachella Valley fringe-toed lizard can and should conduct surveys, with USFWS/CDFG approval, in accordance with the CDFG *Protocol for Determining Coachella Valley Fringe-Toed Lizard (CVFTL) Presence,* to establish whether or not the species is present. The measures listed below are taken largely from the CDFG protocol recommendations and would be adequate as standard mitigation for this species. If the species is determined present then the following applies:

- Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of 3:1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG).

MM-BIO/OS27: Project sponsors with projects within the range and within suitable habitat for the desert tortoise can and should conduct surveys, with USFWS approval, in accordance with the 1992 USFWS *Field Survey Protocol For Any Federal Action That May Occur Within The Range Of The Desert Tortoise,* to establish whether or not the species is present. If the species is determined present then the following applies:

- Upon approval by the USFWS, preconstruction surveys of project impact areas can and should be required to salvage and relocate individual desert tortoise out of harms. Following removal of individuals, construction areas should be fenced with temporary exclusionary silt fencing.

Mitigation for occupied habitat impacted is likely to be compensatory acquisition of mitigation credits or off-site acquisition or protection of similar habitats at a ratio of 3:1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG).

MM-BIO/OS28: California species of special concern (CSC), such as the two-striped garter snake and several bat species are considered special-status species that meet the definition of rare, threatened or endangered species for the purposes of CEQA. Projects within the range and within suitable habitat for California species of special concern can and should conduct surveys in accordance with the best professional judgment of a qualified biologist. The following measures can and should be implemented to further minimize adverse effects to CSC species:

- Preconstruction surveys of project impact areas can and should be required to salvage and relocate individual two-striped garter snakes out of harm. Following removal of individuals, construction areas should be fenced with temporary exclusionary silt fencing.
- Similarly appropriate survey, salvage, and mitigation measures can and should be taken with regard to other CSC classified species. If avoidance of impacts to species is not feasible, on site and/or off site protection of appropriate mitigation lands in perpetuity should be secured for these species.
- Mitigation for occupied habitat is likely to be compensatory acquisition of mitigation credits or off-site acquisition or protection of similar habitats at a ratio of 3:1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG. The two-striped garter snake is not formally listed but considered a special-status species worthy of measures to avoid and minimize impacts to the extent feasible.

MM-BIO/OS29: Project sponsors can and should ensure that to avoid disrupting nesting Swainson's hawks, construction activities at known nesting locations can and should occur between September and March outside the nesting season (nesting typically occurs from March 1 through September 1). Alternatively, if construction activities take place during the nesting season, a qualified biologist can and should conduct a pre-construction survey no more than two weeks before the start of construction for any given milepost and report whether or not there are nesting Swainson's hawks within 500 feet of any project (assuming available authorized access). If there are nesting Swainson's hawks present within the 500-foot buffer areas, construction will be delayed until the CDFG has been consulted to determine suitable avoidance measures. A potential avoidance measure may include delaying all construction activity within 500 feet of an active Swainson's hawk nest until the adult and/or young of the year are no longer reliant on the nest site for survival as determined by a qualified biologist.

MM-BIO/OS30: Project sponsors can and should ensure that no more than two weeks before construction in any given milepost, a survey for burrows and burrowing owls can and should be conducted by a qualified biologist within 500 feet of the project (assuming available authorized access). The survey will conform to the protocol described by the California Burrowing Owl Consortium's 1993 Burrowing Owl Protocol and Mitigation Guideline which includes up to four surveys on different dates if there are suitable burrows present as well as the CDFG's 1995 Staff Report on Burrowing Owl Mitigation. Both mitigation guidelines also recommend habitat land acquisition and protection in perpetuity for project-related loss of occupied wintering and breeding habitat for burrowing owls. If occupied burrowing owl dens are found within the survey area, a determination can and

should be made by a qualified biologist in consultation with CDFG whether or not project work will impact the occupied burrows or disrupt reproductive behavior:

- If it is determined that construction will not impact occupied burrows or disrupt breeding behavior, construction will proceed without any restriction or mitigation measures.
- If it is determined that construction will impact occupied burrows during August through February, the subject owls will be passively relocated from the occupied burrow(s) using one-way doors. There should be at least two unoccupied burrows suitable for burrowing owls within 300 feet of the occupied burrow before one-way doors are installed. Artificial burrows should be in place at least one-week before one-way doors are installed on occupied burrows. One-way doors will be in place for a minimum of 48 hours before burrows are excavated.
- If it is determined that construction will physically impact occupied burrows or disrupt reproductive behavior during the nesting season (March through July) then avoidance is the only mitigation available. Construction should be delayed within 300 feet of occupied burrows until it is determined that the subject owls are not nesting or until a qualified biologist determines that juvenile owls are self-sufficient or are no longer reliant on the natal burrow as their primary source of shelter and survival.
- Mitigation for occupied habitat is likely to be compensatory acquisition of mitigation credits or off-site acquisition or protection of similar habitats at a ratio of 3:1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG.

MM-BIO/OS31: Project sponsors can and should ensure that when working within 100 feet of salt or brackish marshland presence for the California black rail, California clapper rail, and Yuma clapper rail should be assumed for either species during the period February 1-August 31 and construction should be scheduled to begin no earlier than September 1 and end no later than January 31 to avoid potential impact on reproduction. The Department of Fish and Game and United States Fish and Wildlife Service can and should be consulted when projects identify occupied habitat or habitat capable of supporting California clapper rail, light-footed clapper rail, and Yuma clapper rail.

MM-BIO/OS32: Project sponsors with projects within the range and within suitable habitat for the coastal California gnatcatcher can and should conduct surveys, with USFWS approval, in accordance with the 1997 USFWS *Coastal California Gnatcatcher Presence/Absence Survey Guidelines,* to establish whether or not the species is present. If the species is determined present then the following applies:

To avoid disrupting nesting coastal California gnatcatchers, construction activities at known nesting locations should occur between September and March outside the nesting season (nesting typically occurs from March 1 through September 1). Alternatively, if construction activities take place during the nesting season, a qualified biologist can and should conduct a pre-construction survey no more than two weeks before the start of construction for any given milepost and report whether or not there are nesting coastal California gnatcatchers within 500 feet of any project (assuming available authorized access). If there are nesting coastal California gnatcatchers present within the 500-foot buffer areas, construction will be delayed until the USFWS and/or CDFG has been consulted to determine suitable avoidance measures. A potential avoidance measure may include delaying all construction activity within 500 feet of an active coastal California gnatcatchers nest until the adults and/or young of the year are no longer reliant on the nest site for survival as determined by a qualified biologist.

Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of 3:1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG).

MM-BIO/OS33: Project sponsors with projects within the range and within suitable habitat for the least Bell's vireo can and should conduct surveys, with USFWS approval, in accordance with the 2001 USFWS *Least Bell's Vireo Survey Guidelines,* to establish whether or not the species is present. If the species is determined present then the following applies:

To avoid disrupting nesting least Bell's vireo, construction activities at known nesting locations can and should occur between September and March outside the nesting season (nesting typically occurs from March 1 through September 1). Alternatively, if construction activities take place during the nesting season, a qualified biologist can and should conduct a pre-construction survey no more than two weeks before the start of construction for any given milepost and report whether or not there are nesting least Bell's vireo within 500 feet of any project (assuming available authorized access). If there are nesting least Bell's vireo present within the 500-foot buffer areas, construction will be delayed until the CDFG has been consulted to determine suitable avoidance measures. A potential avoidance measure may include delaying all construction activity within 500 feet of an active least Bell's vireo nest until the adults and/or young of the year are no longer reliant on the nest site for survival as determined by a qualified biologist.

Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of 3:1 (compensation acres to that impacted or other similar ratio with the approval of the USFWS and/or CDFG).

MM-BIO/OS34: Project sponsors with projects within the range and within suitable habitat for the southwestern willow flycatcher can and should conduct surveys, with USFWS approval, in accordance with the 2000 USFWS *Southwestern Willow Flycatcher Protocol Survey Guidelines (Revision 2000),* to establish whether or not the species is present. If the species is determined present then the following applies:

To avoid disrupting nesting southwestern willow flycatcher, construction activities at known nesting locations can and should occur between September and March outside the nesting season (nesting typically occurs from March 1 through September 15). Alternatively, if construction activities take place during the nesting season, a qualified biologist can and should conduct a pre-construction survey no more than two weeks before the start of construction for any given milepost and report whether or not there are nesting southwestern willow flycatcher within 500 feet of any project (assuming available authorized access). If there are nesting southwestern willow flycatchers present within the 500-foot buffer areas, construction will be delayed until the CDFG has been consulted to determine suitable avoidance measures. A potential avoidance measure may include delaying all construction activity within 500 feet of an active southwestern willow flycatcher nest until the adults and/or young of the year are no longer reliant on the nest site for survival as determined by a qualified biologist.

Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats at a ratio of 3:1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS and/or CDFG).

MM-BIO/OS35: Project sponsors can and should ensure that suitable nesting sites for migratory nongame native bird species protected under the Federal Migratory Bird Treaty Act and/or trees

with unoccupied raptor nests (large stick nests or cavities) should only be removed prior to February 1, or following the nesting season.

A survey to identify active raptor and other migratory nongame bird nests can and should be conducted by a qualified biologist at least two weeks before the start of construction at project sites from February 1 through August 31. Active raptor nests can and should be re-located within 500 feet of the project to the extent feasible and assuming available authorized access. Suitable nesting habitat for protected native birds can and should be re-located within 300 feet of the project.

- Beginning thirty days prior to the disturbance of suitable nesting habitat, the project sponsor can and should arrange for weekly bird surveys conducted by a qualified biologist with experience in conducting breeding bird surveys to detect protected native birds occurring in the habitat that is to be removed and any other such habitat within 300 feet of the construction work area (within 500 feet for raptors) as access to adjacent areas allows. The last survey can and should be conducted no more than 3 days prior to the initiation of clearance/construction work.
- If an active raptor nest is found within 500 feet of the project or nesting habitat for a protected native bird is found within 300 feet of the project a determination can and should be made by a qualified biologist in consultation with CDFG whether or not project construction work will impact the active nest or disrupt reproductive behavior.
- If it is determined that construction will not impact an active nest or disrupt breeding behavior, construction will proceed without any restriction or mitigation measure. If it is determined that construction will impact an active raptor nest or disrupt reproductive behavior then avoidance is the only mitigation available. Construction can and should be delayed within 300 feet of such a nest (within 500 feet for raptor nests), until August 31 or as determined by CDFG, until the adults and/or young of the year are no longer reliant on the nest site for survival and when there is no evidence of a second attempt at nesting as determined by a qualified biologist. Limits of construction to avoid a nest can and should be established in the field with flagging and stakes or construction fencing marking the protected area 300 feet (or 500 feet) from the nest. Construction personnel can and should be instructed on the sensitivity of the area.
- Documentation to record compliance with applicable State and Federal laws pertaining to the protection of native birds can and should be recorded.

Natural Lands

MM-BIO/OS36: Project sponsors can and should conduct site-specific analyses of opportunities to preserve or improve habitat linkages with areas on- and off-site. Habitat linkages/wildlife movement corridors can and should be analyzed on a broader and cumulative impact analysis scale to avoid adverse impacts from linear projects that have potential for impacts on a broader scale or critical narrow choke points that could reduce function of recognized movement corridors on a larger scale. A qualified biologist will review construction drawings and habitat connectivity mapping provided by the CDFG or CNDDB will be used to determine the risk of habitat fragmentation. Mitigation banking to preserve habitat linkages and corridors (opportunities to purchase, maintain, and/or restore offsite habitat) is one opportunity that project sponsor and local jurisdictions may pursue.

MM-BIO/OS37: Project sponsors can and should evaluate the potential for overpasses, underpasses, and culverts in cases where a roadway or other transportation project may interrupt the flow of species through their habitat. Wildlife crossings/access can and should be provided in accordance with proven standards, such as FHWA's Critter Crossings or Ventura County Mitigation Guidelines and in consultation with wildlife corridor authorities with sufficient knowledge of both regional and local wildlife corridors, and at locations useful and appropriate for the species of concern.

MM-BIO/OS38: Project sponsors can and should include analysis of wildlife corridors during project planning. Impacts to these corridors should be avoided and/or minimized.

MM-BIO/OS39: Project sponsors can and should use wildlife fencing where appropriate to minimize the probability of wildlife injury due to direct interaction between wildlife and roads. Wildlife fencing used can and should be based on proven designs for impacted species and developed in conjunction with wildlife corridor authorities with sufficient knowledge of both regional and local wildlife corridors. Project sponsors can and should take advantage of natural environmental buffers (i.e. streams or fields) to protect wildlife habitat from nearby transportation infrastructure. Inclusion of this mitigation measure can and should be considered on a case-by-case basis, as use of wildlife fencing could further increase the effects of habitat fragmentation and isolation for many species. Also see Mitigation Measures **MM-BIO/OS1** through **MM-BIO/OS21**.

MM-BIO/OS40: Project sponsors can and should avoid siting new 2012-2035 RTP/SCS transportation facilities within areas not presently exposed to impacts from transportation facilities. If avoidance is infeasible, the project should minimize vehicular accessibility to areas beyond the actual transportation surface. This can be accomplished through fencing and signage. Additionally, the area of native habitats to be lost to proximity to a transportation facility should be assessed and habitat at a quality of equal or superior value can and should be secured and protected in perpetuity.

Threats to Biological Resources in the SCAG Region

MM-BIO/OS41: Project sponsors can and should establish litter control programs in appropriate areas, such as receptacles at road turnouts, rest stops, and viewpoints. All refuse containers can and should be provided with mechanisms which prevent scavenging animals from gaining access to the contents of such containers.

MM-BIO/OS42: Project sponsors can and should use road noise minimization methods, such as brush and tree planting, at heavy noise-producing transportation areas that might affect wildlife. Native vegetation can and should be used.

MM-BIO/OS43: Project sponsors can and should avoid and/or minimize construction activities that have the potential to expose species to noise, smoke, or other disturbances. Pre-construction surveys can and should be conducted as appropriate to determine the presence of any species that would need to be protected from such an impact.

Protection of Biological Resources in the SCAG Region

MM-BIO/OS44: Future impacts to biological resources shall be minimized through cooperation, information sharing, and program development as part of SCAG's regional planning efforts. SCAG shall consult with the resource agencies, such as USFSW and CDFG, as well as local jurisdictions to incorporate any local HCPs or other similar planning documents. Planning efforts shall be in accordance with the approach outlined in the California Wildlife Action Plan.

MM-BIO/OS45: SCAG shall develop a conservation strategy in coordination with local jurisdictions and agencies, including CTCs to determine priority conservation areas and develop regional mitigation policies. SCAG shall produce and maintain a list/map of potential conservation opportunity areas based on most recent land use data. These conservation opportunity areas may be used by local jurisdictions and project sponsors as priority areas for mitigating impacts to open space resources. SCAG's forthcoming regional conservation planning policy will include additional information on conservation opportunity areas.

MM-BIO/OS46: SCAG shall use its IGR process to review projects with potentially significant impacts to open space and recommend impact avoidance and mitigation measures.

MM-BIO/OS47: Project sponsors can and should ensure that transportation systems proposed in the 2012-2035 RTP/SCS avoid or mitigate significant impacts to natural lands, community open space and important farmland, including cumulative impacts and open space impacts from the growth associated with transportation projects and improvements.

MM-BIO/OS48: Individual projects submitted for IGR review can and should either avoid significant impacts to regionally significant open space resources or mitigate the significant impacts through measures consistent with regional open space policies for conserving natural lands, community open space and farmlands. All projects submitted for IGR review can and should demonstrate consideration of alternatives that would avoid or reduce impacts to open space.

MM-BIO/OS49: Project sponsors can and should include into project design, to the maximum extent practicable, mitigation measures and recommended best practices aimed at minimizing or avoiding impacts to natural lands, including, but not limited to FHWA's Critter Crossings, Ventura County Mitigation Guidelines, CDFG's Wildlife Action Plan and any applicable conservation plans.

MM-BIO/OS50: For projects adjacent to natural watercourses, project sponsors can and should submit a vegetation management plan for review and approval by the Lead Agency that includes, as deemed appropriate, the following measures:

- Identify and do not disturb a 20-foot buffer from the top of the natural watercourse. If the top of bank cannot be identified, leave a 50-foot buffer from the centerline of the watercourse or as wide a buffer as possible between the watercourse centerline and the proposed site development.
- Identify and leave" islands" of vegetation in order to prevent erosion and landslides and protect nesting habitat.
- Leave at least 6 inches of vegetation on the site.
- Trim tree branches from the ground up (climbing up) and leave tree canopy intact.
- Leave stumps and roots from cut down trees to prevent erosion.
- Plant fire-appropriate, drought-tolerant, preferably native vegetation.
- Err on the side of caution; if a plant, tree or area is sensitive, obtain a second opinion before cutting.
- Provide erosion and sediment control protection if cutting vegetation on a steep slope.
- Leave tall shrubbery at least 3-feet high.
- Fence off sensitive plant habitats and creek areas to protect from animal grazing as appropriate and necessary.
- Do not clear-cut vegetation. This can lead to erosion and severe water quality problems and destroy important habitat.

- Do not remove vegetation within 20-feet of the top of bank. If the top of bank cannot be identified, do not cut within 50-feet of the centerline of the natural watercourse or as wide a buffer as possible between the natural watercourse centerline and the proposed site development.
- Do not trim/prune branches that are larger than 4 inches in diameter.
- Do not remove tree canopy.
- Do not dump cut vegetation in a creek.
- Do not cut tall shrubbery to less than 3-feet high.
- Do not cut of short vegetation (grasses, ground-cover) to less than 6-inches high.

MM-BIO/OS51: As appropriate conduct a biological assessment for any site/corridor where there is the potential for impacts to significant biological resources including threatened or endangered species, sensitive habitats/species and/or protected trees.

MM-BIO/OS52: **Shade Tree Planting:** Local jurisdictions or agencies can and should promote the planting of shade trees and establish shade tree guidelines and specifications, including:

- Recommendations for tree planting based on the land use (residential, commercial, parking lots, etc.);
- Recommendations for tree types based on species size, branching patterns, whether deciduous or evergreen, whether roots are invasive, etc.;
- Recommendations for placement, including distance from structures, density of planting, and orientation relative to structures and the sun.

MM-BIO/OS53: **Urban Forestry Management:** Local jurisdictions or agencies can and should develop an Urban Forestry Program to consolidate policies and ordinances regarding tree planting, maintenance, and removal, including:

- Establish a tree-planting target and schedule to support the goals of the California Climate Action Team to plant 5 million trees in urban areas by 2020;
- Establish guidelines for tree planting, including criteria for selecting deciduous or evergreen trees low-VOC-producing trees, and emphasizing the use of drought-tolerant native trees and vegetation.

MM-BIO/OS54: Local jurisdictions or agencies can and should establish policies and programs to restore, protect, manage and preserve conservation areas, including forested areas, agricultural lands, wildlife habitat and corridors, wetlands, watersheds, and groundwater recharge areas, that remove and sequester carbon from the atmosphere.

MM-BIO/OS55: **Conservation Area Development:** Local jurisdictions or agencies can and should establish programs and funding mechanisms to create protected conservation areas, including:

- Imposing mitigation fees for development on lands that would otherwise be conservation areas, and use the funds generated to protect other areas from development;
- Proposing for voter approval a small tax increment (e.g., a quarter cent sales tax, perhaps for a finite time period that could be renewed) to fund the purchase of development rights in conservation areas, or purchase of the land outright.

MM-BIO/OS56: **Conservation Area Preservation:** Local jurisdictions or agencies can and should establish policies to preserve existing conservation areas, and to discourage development in those areas.

MM-BIO/OS57: Local jurisdictions or agencies can and should manage its stock of vegetation to reduce GHG emissions.

MM-BIO/OS58: Local jurisdictions can and should conduct a comprehensive inventory and analysis of the urban forest, and coordinate tree maintenance responsibilities with all responsible departments, consistent with best management practices.

MM-BIO/OS59: Local jurisdictions or agencies can and should evaluate existing landscaping and options to convert reflective and impervious surfaces to landscaping, and install or replace vegetation with drought-tolerant, low-maintenance native species or edible landscaping that can also provide shade and reduce heat-island effects.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Ecosystems in the SCAG Region

Implementation of Mitigation Measures **MM-BIO/OS1** through **MM-BIO/OS3** would reduce the potential impacts to ecosystems in the SCAG region; however, due to the regional scale of the Plan, the impact remains significant.

Special Status Species and Natural Communities

Implementation of Mitigation Measures **MM-BIO/OS4** through **MM- BIO/OS35** would reduce the potential impacts to Special Status Species and Natural Communities in the SCAG region; however, due to the regional scale of the Plan, the impact remains significant.

Natural Lands

Implementation of Mitigation Measures **MM-BIO/OS36** through **MM-BIO/OS40** would reduce the potential impacts to natural lands in the SCAG region; however, it is anticipated that impacts to natural lands would not be able to be mitigated in every instance. Therefore, this impact remains significant.

Threats to Biological Resources in the SCAG Region

Implementation of Mitigation Measures **MM-BIO/OS41** through **MM-BIO/OS43** would reduce the potential impacts to biological resource threats in the SCAG region; however, while the mitigation measures outlined above would avoid or minimize impacts, however, due to the scale of the Plan, the impact remains significant.

Protection of Biological Resources in the SCAG Region

Implementation of Mitigation Measures **MM-BIO/OS44** through **MM-BIO/OS59** would increase the protection of biological resources in the SCAG region; however, while the mitigation measures outlined above would avoid or minimize impacts, however, due to the scale of the Plan this impact remains significant.

Cumulative Effects

Mitigation Measures **MM-BIO/OS1** through **MM-BIO/OS59** would reduce cumulative impacts related to biological resources and open space outside the region. However, potential cumulative impacts to biological resources and open space outside the region would remain cumulatively considerable.

COMPARISON WITH THE NO PROJECT ALTERNATIVE

Under the No Project Alternative, the population of the SCAG region would grow by 3.9 million people, however, only the transportation projects that received federal environmental clearance by December 2010, projects in the 2011 FTIP, and projects currently under construction or right of way approval would be developed. The population distribution would follow past trends, uninfluenced by additional transportation investments.

Direct Impacts

Under the No Project Alternative, there would be no new transportation projects (beyond those projects that would occur regardless of adoption of the Plan) intersecting sensitive communities, known locations or habitats of special status species, riparian habitats, wetlands, rangelands, or open space in the region. However, the No Project would result in a more spread out pattern of development that would consume far more vacant land than the Plan (742 square miles compared to 334 square miles while land use policies in the Plan would seek to strictly limit development outside targeted areas. As this spread out growth pattern would consume a greater number of vacant lands, the Plan's impacts to biological resources and open space would be less than the No Project Alternative. **No Project impacts to biological resources would be greater than those of the Plan because of the increase in land consumption that would result from a more dispersed land use pattern.**

Cumulative Impacts

The No Project Alternative's cumulative impacts to biological resources and open space due to urban development would be greater than those of the 2012-2035 RTP/SCS because of the increased consumption of vacant, open space, and agricultural lands. The spread out growth pattern that would occur under the No Project Alternative would also be expected to result in habitat fragmentation and other biological impacts to areas outside the region. In fact, as more vacant lands would be consumed, and many of the areas that would be affected would likely be undeveloped areas on the fringe of the region, it would be anticipated that these effects on biological resources would be even greater. **Therefore, the No Project Alternative's cumulative impacts to biological resources and open space would be greater than those of the 2012-2035 RTP/SCS.**

3.4 CULTURAL RESOURCES

This section describes the current cultural resources in the SCAG region, discusses the potential impacts of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategies (2012-2035 RTP/SCS or Plan) on cultural resources, identifies mitigation measures for the impacts, and evaluates the residual impacts.

REGULATORY FRAMEWORK

Cultural resources in the six-county SCAG region include structures of national, State, or local significance, archaeological sites of historic or prehistoric origin, and fossil deposits of paleontological importance. These resources are regulated at the federal, State, and local levels as discussed below.

Federal

National Environmental Policy Act (NEPA). NEPA (42 U.S.C. 4321 et seq.) became law on January 1, 1970 and mandates that all federal agencies carry out their regulations, policies, and programs in accordance with NEPA's policies of environmental protection. NEPA encourages the protection of all aspects of the environment and requires federal agencies to utilize a systematic, interdisciplinary approach to agency decision-making that will ensure the integrated use of natural sciences such as geology. NEPA addresses a wide range of environmental issues including the documentation of, and evaluation of potential impacts to, cultural and historic properties. Compliance includes an on-site survey by a qualified archaeologist prior to construction. A report of findings may be submitted to the State Historic Preservation Office (SHPO) for further consultation.

United States Department of Transportation (USDOT) Act of 1966 (Section 4[f]). Section 4(f) of the USDOT Act of 1966 affords special protection to public recreational lands and facilities, including local parks and school facilities that are open and available to the general public for recreational purposes, significant cultural resources, historical resources, and natural wildlife refuges. Federally-funded transportation improvement projects are prohibited from the encroachment (direct or constructive use, or a take) of Section 4(f) lands unless it can be demonstrated that no feasible and prudent alternative exists.

National Register of Historic Places (National Register). The National Register recognizes properties that are significant at the national, State, and/or local levels. Although administered by the National Park Service, the federal regulations explicitly provide that National Register listing of private property "does not prohibit under federal law or regulation any actions which may otherwise be taken by the property owner with respect to the property." Listing in the National Register assists in preservation of historic properties through: recognition that a property is of significance to the nation, the State, or the community; consideration in the planning for federal or federally-assisted projects; eligibility for federal tax benefits; consideration in the decision to issue a surface coal mining permit; and qualification for federal assistance for historic preservation, when funds are available. In addition, for projects that receive federal funding, a clearance process must be completed in accordance with Section 106 of the National Historic Preservation Act (NHPA). Furthermore, State and local regulations may apply to properties listed in the National Register.

The criteria for listing in the National Register follow the standards for determining if properties, sites, districts, structures, or landscapes of potential significance are eligible for nomination. In addition to meeting any or all of the following criteria, properties nominated must also possess integrity of location, design, setting, feeling, workmanship, association, and materials:

A. Associated with events that have made a significant contribution to the broad patterns of our history;
B. Associated with the lives of persons significant in our past;

C. Embody the distinctive characteristics of a type, period, or method of construction 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; or
D. Yield, or may be likely to yield, information important in prehistory or history.

Historic integrity is the ability of a property to convey its significance and is defined as "the authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's historic period."

The National Register recognizes seven aspects or qualities that comprise integrity: location, design, setting, materials, workmanship, feeling, and association. These qualities are defined as follows:

- Location is the place where the historic property was constructed or the place where the historic event occurred;
- Design is the combination of elements that create the form, plan, space, structure, and style of a property;
- Setting is the physical environment of a historic property;
- 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 is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory;
- Feeling is a property's expression of the aesthetic or historic sense of a particular period of time; and
- Association is the direct link between an important historic event or person and a historic property.

In assessing a property's integrity, the National Register criteria recognize that properties change over time. In this regard, National Register Bulletin 15 states:

> *"To retain historic integrity a property will always possess several, and usually most, of the aspects. The retention of specific aspects of integrity is paramount for a property to convey its significance.*
>
> *It is not necessary for a property to retain all its historic physical features or characteristics. The property must retain, however, the essential physical features that enable it to convey its historic identity.*
>
> *A property that has lost some historic materials or details can be eligible if it retains the majority of the features that illustrate its style in terms of the massing, spatial relationships, proportion, pattern of windows and doors, texture of materials, and ornamentation. The property is not eligible, however, if it retains some basic features conveying massing but has lost the majority of the features that once characterized its style."*

For properties that are considered significant under National Register Criteria A and B, National Register Bulletin 15 states:

> *"A property that is significant for its historic association is eligible if it retains the essential physical features that made up its character or appearance during the period of its association with the important event, historical pattern, or person(s).*
>
> *A property important for illustrating a particular architectural style or construction technique must retain most of the physical features that constitute that style or technique."*

Historic Sites Act of 1935 (HSA). The HSA became law on August 21, 1935 and declared that it is national policy to "Preserve for public use historic sites, buildings, and objects of national significance." The NHPA expanded the scope to include important state and local resources. Provisions of NHPA established the National Register maintained by the National Park Service, advisory councils on Historic Preservation, State Historic Preservation Offices, and grants-in-aid programs. Section 106 of the NHPA requires all federal

agencies to consult the Advisory Council before continuing any activity affecting a property listed on or eligible for listing on the National Register. The Advisory Council has developed regulations for Section 106 to encourage coordination of agency cultural resource compliance requirements (Executive Order 11593).

Antiquities Act of 1906. The Antiquities Act of 1906, which aimed to protect important historic and archaeological sites, initiated historic preservation legislation. It established a system of permits for conducting archaeological studies on federal land, as well as setting penalties for noncompliance. This permit process controls the disturbances that may be caused to archaeological sites. New permits are currently issued under the Archaeological Resources Protection Act (ARPA) of 1979. The purpose of ARPA is to enhance preservation and protection of archaeological resources on public and Native American lands.

National Historic Preservation Act (NHPA). The NHPA supplements the provisions of the Antiquities Act of 1906 and established laws for historic resources to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice." The law makes it illegal to destroy, excavate, or remove from federal or Indian lands any archaeological resources without a permit from the land manager. Regulations for the ultimate disposition of materials recovered as a result of permitted activities state that archaeological resources excavated on public lands remain the property of the United States. Archaeological resources excavated from Indian lands remain the property of the Indian or Indian tribe having rights of ownership over such resources.

Archaeological and Historic Preservation Act of 1974 (AHPA). Passed and signed into law in 1974, The AHPA amended and expanded the Reservoir Salvage Act of 1960. The AHPA requires that federal agencies provide for the preservation of historical and archaeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of any alteration of the terrain caused by any federal construction project or federally licensed activity or program.

Archaeological Resources Protection Act (ARPA). The ARPA applies when a project may involve archaeological resources located on federal or tribal land. ARPA requires that a permit be obtained before excavation of an archaeological resource on such land can take place.

The American Indian Religious Freedom Act (AIRFA). The AIRFA proclaims that the U.S. Government will respect and protect the rights of Indian tribes to the free exercise of their traditional religions; the courts have interpreted this as requiring agencies to consider the effects of their actions on traditional religious practices.

Native American Graves Protection and Repatriation Act of 1990 (NAGPRA). The NAGPRA also applies if human remains of Native American origin are discovered on federal land. NAGPRA requires federal agencies and federally assisted museums to return “Native American cultural items” to the federally recognized Indian tribes or Native Hawaiian groups with which they are associated. Regulations (43 CFR Part 10) stipulate the following procedures be followed. If Native American human remains are discovered, the following provisions would be followed to comply with regulations:

- Notify, in writing, the responsible federal agency;
- Cease activity in the area of discovery and protect the human remains;
- Certify receipt of the notification;
- Take steps to secure and protect the remains;
- Notify the Native American tribes or tribes likely to be culturally affiliated with the discovered human remains within one working day; and
- Initiate consultation with the Native American tribe or tribes in accordance with regulations described in 43 CFR, Part 10, Subpart B, Section 10.5.

State

Office of Historic Preservation (OHP). As an office of the California Department of Parks and Recreation, the OHP implements the policies of the NHPA on a statewide level. The OHP also carries out the duties set forth in the Public Resources Code and maintains the California Historic Resources Inventory.

The State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the state's jurisdiction. Also implemented at the State level, CEQA requires projects to identify any substantial adverse impacts which may affect the significance of identified historical resources.

California Register of Historical Resources (California Register). The California Register is "an authoritative listing and guide to be used by State and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change."[1] The criteria for eligibility for the California Register are based upon National Register criteria. These criteria are:

- Criterion 1 – Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California of the United States;
- Criterion 2 – Associated with the lives of persons important to local, California or national history;
- Criterion 3 – Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values; and
- Criterion 4 – Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

The California Register consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The California Register automatically includes the following:

- California properties listed in the National Register of Historic Places (Category 1 in the State Inventory of Historical Resources) and those formally Determined Eligible for listing in the National Register of Historic Places (Category 2 in the State Inventory)
- California Registered Historical Landmarks from No.0770 onward
- Those California Points of Historical Interest that have been evaluated by the Office of Historic Preservation (OHP) and have been recommended to the State Historical Resources Commission for inclusion in the California Register

Other resources which may be nominated for listing in the California Register include:

- Historical resources with a significance rating of Categories 3 through 5 in the State Inventory. (Categories 3 and 4 refer to potential eligibility for the National Register, while Category 5 indicates a property with local significance);
- Individual historical resources;
- Historical resources contributing to historic districts; and
- Historical resources designated or listed as a local landmark.

Additionally, a historic resource eligible for listing in the California Register must meet one or more of the criteria of significance described above and retain enough of its historic character or appearance to be recognizable as a historic resource and to convey the reasons for its significance. Historical resources that have been rehabilitated or restored may be evaluated for listing.

[1] Public Resources Code Section 50241(e).

California Environmental Quality Act (CEQA). Under CEQA a "project that may cause a substantial adverse change in the significance of a historic resource is a project that may have a significant effect on the environment."[2] This statutory standard involves a two-part inquiry. The first involves a determination of whether the project involves a historic resource. If so, then the second part involves determining whether the project may involve a "substantial adverse change in the significance" of the resource. To address these issues, guidelines that implement the 1992 statutory amendments relating to historical resources were adopted in final form on October 26, 1998 with the addition of State CEQA Guidelines Section 15064.5. The CEQA Guidelines provide that for the purposes of CEQA compliance, the term "historical resources" shall include the following:[3]

- A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register;
- A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in a historical resource survey meeting the requirements in Section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat such resources as significant for purposes of CEQA unless the preponderance of evidence demonstrates that it is not historically or culturally significant;
- Any object, building, structure, site, area, place, record, or manuscript which 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 may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be 'historically significant' if the resource meets one of the criteria for listing on the California Register; and
- The fact that a resource is not listed in, or determined to be eligible for listing in the California Register, not included in a local register of historical resources (pursuant to Section 5020.1(k) of the Public Resources Code), or identified in a historical resources survey (meeting the criteria in Section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be a historical resource as defined in Public Resources Code Sections 5020.1(j) or 5024.1.

Section 15064.5 of the CEQA Guidelines also provides that "[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."[4] Material impairment occurs when a project alters or demolishes in an adverse manner "those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion" in a state or local historic registry.[5]

California Public Resources Code, Sections 5097.5, 5097.9, and 5097.98-99. Section 5097.5 of the Public Resources Code defines as a misdemeanor the unauthorized disturbance or removal of archaeological, historical, or paleontological resources located on public lands. This Section also prohibits the knowing destruction of objects of antiquity without a permit (expressed permission) on public lands, and provides for criminal sanctions. In 1987, it was amended to require consultation with the California Native American Heritage Commission whenever Native American graves are found. It also established that violations for taking or possessing remains or artifacts are felonies.

Public Resources Code Section 5097.9 establishes the California Native American Heritage Commission to make recommendations to encourage private property owners to protect and preserve sacred places in a natural state and to allow appropriate access to Native Americans for ceremonial or spiritual activities. The Commission is authorized to assist Native Americans in obtaining appropriate access to sacred places on

[2]Public Resources. Code Section 21084.1.
[3]CEQA Guidelines Section 15064.f(e).
[4]CEQA Guidelines Section 15064.5(b)(1).
[5]CEQA Guidelines Section 15064.5(b)(2)(A-C).

public lands, and to aid State agencies in any negotiations with federal agencies for the protection of Native American sacred places on federally administered lands in California.

Public Resources Code Sections 5097.98 through 5097.99 require that the Governor's California Native American Heritage Commission be consulted whenever Native American graves are found. According to these Sections, it is illegal to take or possess remains or artifacts taken from Native American graves; however, it does not apply to materials taken before 1984. Violations occurring after January 1, 1988 are felonies.

California Coastal Act (CCA). The CCA (Public Resources Code Sections 30000 *et seq.*) includes protection of archaeological resources into Land Conservation Plans that regulate land uses within the coastal zone.

Native American Heritage Commission (NAHC). Section 50907.9 of the Public Resources Code and Section 7050 of the Health and Safety Code authorizes the NAHC to regulate Native American concerns regarding the excavation and disposition of Native American cultural resources. Among its duties, the Commission is authorized to resolve disputes relating to the treatment and disposition of Native American human remains and items associated with burials. Upon notification of the discovery of human remains by a county coroner, the Commission notifies the Native American group or individual most likely descended from the deceased.

Local

In addition to federal and State regulations, cities and counties in the SCAG region may also provide regulatory protection and advisement regarding cultural resources. California law requires that a General Plan include seven elements (Land Use, Open Space, Conservation, Housing, Circulation, Noise, and Safety). Many jurisdictions incorporate policies related to cultural and historical resources into the Conservation Element. Other jurisdictions choose to prepare a separate (optional) element dealing with cultural and/or historic preservation issues. Many jurisdictions also prepare ordinances addressing cultural resources and historic preservation.

EXISTING SETTING

Cultural History of the SCAG Region

Prehistoric Period (Prior to 1542). The Prehistoric cultural history of the SCAG region can be outlined by the following chronology:[6]

Early Man Horizon. Spanning the period from the end of the Pleistocene to approximately 6,000 BC, archaeological resources attributed to this horizon are characterized by large projectile points and scrapers.

Milling Stone Horizon. Characterized by the appearance of hand stones and milling stones, this horizon tentatively dates to between 6,000 BC and 1,000 BC. Cultural resources from this period include choppers and scraper planes but generally lack projectile points. Larger projectile points appeared in the latter portion of the Milling Stone Horizon.

Intermediate Horizon. Dated to between 1,000 BC and AD 750, the Intermediate Horizon represents a transitional period. Cultural resources from the Intermediate Horizon sites contain large stemmed or notched projectile points and portable mortar and pestles.

[6]Wallace, W. J. (1955), A Suggested Chronology for Southern California Coastal Archeology, *Southwestern Journal of Anthropology 11(3),* 214-230.

Late Prehistoric Horizon. Extending from AD 750 to Spanish contact in AD 1769, the Late Prehistoric Horizon reflects an increased sophistication and diversity in technology. This is characterized by the presence of small projectile points, which imply the use of the bow and arrow. Additional cultural resources include steatite bowls, asphaltum, grave goods, and elaborate shell ornaments.

Protohistoric Period (1542 to 1769). Although early Spanish explorers and mission fathers recorded information on the local Native American populations, professional anthropological studies did not begin until the end of the 19th Century after most of the SCAG region Indian groups had been either assimilated by Spanish, Mexican, and American cultures or relocated to reservations.

The SCAG region once was the home to at least eleven distinct Native American groups. These include the Cahuilla, Chumash, Gabrielino, Halchidhoma, Kitanemuk, Luiseno, Mohave, Quechan, Serrano, Southern Paiute, Tataviam, and Tipai. The territorial boundaries of the Native Americans who were residing in Southern California at the time of first European contact do not coincide with today's political boundaries. Moreover, many tribal boundaries overlapped and most groups migrated within their general boundaries throughout the year.

The federal government established reservations in Southern California between 1875 and 1891. This includes the Martinez, Fort Yuma, and Colorado River reservations in Imperial County. In Riverside County are Chemehuevi, Fort Mojave, Torres, Cabazon, Augustine, Santa Rosa, Ramona, Pechanga, Soboba, Agua Caliente, Mission Creek, and Morongo. The two reservations in San Bernardino County are the San Manuel and Twenty-nine Palms reservations. No reservations were established in Los Angeles, Ventura, or Orange Counties. It was believed that the local Native American groups in those counties had become extinct.

Historic Resources

Historic resources are classified into three distinct time periods of the region's history: the Spanish Period, the Mexican Period, and the American Period.

Spanish Period (1769-1822). Exploration of California first occurred in 1540 when a land expedition under the command of Hernando de Alarcon traversed inland along the Colorado River. Two years later, Juan Rodriquez Cabrillo was commissioned by the Spanish government to investigate the western shores of the newly acquired territory. In the following two centuries, little interest was given to California.

By the late 18th Century, European political powers created renewed interest in California. Military "explorers" from Great Britain, France and Russia began investigating the resources along the western shores of the entire North American continent. The Spanish government, realizing that settlement by any of these foreign parties north of Mexico could become a threat, decided it was time to establish their own settlements in California. In 1769, plans were put in place to found a series of free-standing towns (pueblos), forts (presidios), and Catholic missions along the Alta California coast extending as far north as Monterey Bay.

Over the course of the next half-century, four presidios, twenty missions and three towns were established. The presidios were located at San Diego, Santa Barbara, Monterey and San Francisco. The pueblos were founded at Los Angeles (1781), San Jose (1777) and Branciforte (1797), near Santa Cruz. The settlement at Branciforte failed within five years due to its location and the social construct of the inhabitants but all the other pueblos were successful.

During the early decades of the 19th Century, independence groups sprang up throughout the Spanish Empire. Mexico declared its independence in 1810. This attempt failed, but a second attempt ten years later succeeded. At that time, California was considered a province of Mexico. Throughout the Spanish Period, California remained largely unsettled. **Table 3.4-1** lists California Historical Landmarks from the Spanish Period.

TABLE 3.4-1: CALIFORNIA HISTORIC LANDMARKS OF THE SPANISH PERIOD (1769-1821)

CA Historic Landmark No.	Site Name	General Location	Year
43	The Zanja	Redlands	1819-1820
95	Guahama Rancheria	Redlands	1810
101	Giant Desert Figures	16 miles N of Blythe	N/A
103	De Anza Camp Site	SE of Anza	1774
104	Village of Pochea	Hemet	1774
113	Site of Junipero Serra's Cross	Ventura	1782
114	Old Mission Reservoir	Ventura	1805-1815
114-1	San Buenaventura Aqueduct	Ventura	1805-1815
145	Avila Adobe	Los Angeles	1818
156	Los Angeles Plaza	Los Angeles	1781
157	Mission San Fernando Rey de Espana	Mission Hills	1797
158	Mission San Gabriel Archangel	San Gabriel	1771
161	Site of Mission Vieja	Montebello	1770s
186	Serrano Tanning Vats	8 miles SE of Corona	1819
187	Carved Rock	8 miles S of Corona	N/A
190	Painted Rock	7 miles S of Corona	N/A
200	Mission San Juan Capistrano	San Juan Capistrano	1776
204	Old Santa Ana	Orange	1769
302	Old Mill	San Marino	1816
310	Mission San Buenaventura	Ventura	1782
350	Mission Purisima Concepcion	S of Winterhaven	1780
363	Centinela Springs	Inglewood	N/A
383	Site of Jose Dolores Sepulveda Adobe	Torrance	1818
451	Ortega-Vigare Adobe	San Gabriel	1792-1805
522	Serra Springs	Los Angeles	1769
556	Rancho San Francisco	Valencia	1804
557	Hemet Maze Stone	Hemet	N/A
568	Hernando de Alarcon Expedition	Andrade	1540
618	Garces-Smith Monument	San Bernardino National Forest	1776
620	Yucaipa Rancheria	Yucaipa	1822
624	Warring Park	Piru	1769
638	Old Temescal Road	South of Corona	1820
655	Portola Trail Campsite (I)	Los Angeles	1769
659	Stagecoach Inn	Newbury Park	1876
665	Portola Camp Site (II)	Beverly Hills	1769
689	Los Encinos State Historic Park	Encino	1797
727	Portola Expedition Campsite	Santa Paula	1769
753	San Fernando Cemetery	Sylmar	1800s
781	National Old Trails	Needles	1776
787	De Anza Crossing	Riverside	1775, 1776
911	Chatsworth Calera Site	Chatsworth	1800s
921	Mission San Pedro y San Pablo	Northeast of Bard	1781
965	Point Dume	Malibu	1793
977	The Arrowhead	San Bernardino	N/A
984	Casa Rancho San Antonio	Bell Gardens	1810
1008	Yuha Well	Near Seeley	1774

SOURCE: California Department of Parks and Recreation, Office of Historic Preservation, California State Historic Landmarks listed by County, available at: *http://ceres.ca.gov/geo_area/counties/lists/land marks_county.html*, accessed August 1, 2011.

Mexican Period (1822-1848). When Mexico first gained political independence from Spain, little changed for the citizens of California. The defining event from this time period was the secularization of the Catholic Missions in 1834, following the Act of Secularization of 1833. Over the following sixteen years, all of the former mission lands were granted to secular landowners.

Secularization proved disastrous for the Native Americans who were part of the mission system. In fact, the Native Americans were self-sufficient long before the arrival of Spanish domination. The mission system made the indigenous population completely dependent on the missions. When the missions were closed the Indians were left to fend for themselves.

During the two-decade period between the 1830s until 1848, one government after another ruled California. Meanwhile, the United States pushed west across the North American continent. By 1846, a number of Americans had settled in California, often marrying into landed Hispanic families. Between 1835 and 1846 relations between Mexico and the United States deteriorated. In 1846, a revolt was attempted in Northern California. Although it was quickly thwarted, it planted the seeds for the eventual insurrection that succeeded. Within three weeks, an American naval force appeared off the California coast and formally proclaimed rule over the presidios and coastal towns. On January 13, 1847, Captain John C. Fremont accepted the surrender of Governor Pio Pico and Commander Jose Maria Flores. The United States annexed California by the Treaty of Guadalupe Hidalgo in 1848, ending the Mexican War and beginning the American Period. **Table 3.4-2** lists California Historical Landmarks from the Mexican Period.

American Period (1848 – Present). Shortly after the United States annexed California, gold was discovered in central California, changing the State forever. Within months of the news, droves of foreigners poured into California. At the same time, the cattle industry flourished, causing some ranch owners to become wealthy. However, the legality of the land grants issued by the Spanish and Mexican governments came into question. It took the American courts years to decide each individual case. In the meantime, many of the Mexican landowners lost their great ranches to the new Americans through marriage or more often, through deceit.

By the time of the American Civil War (1861-1865), Americans were the dominant group in Southern California, both politically and economically. Their feelings toward the war were divided, but generally Southern sympathizers outnumbered Northern supporters. During this same decade, a great drought struck Southern California, devastating the cattle industry. As a result, many of the former cattle ranches were sold off and used for agricultural purposes. The railroad came to Southern California during the 1870s, resulting in the first great land boom. New towns began to spring up along the new rail lines. Places once thought too desolate soon attracted settlers. As a result of new towns in places like the Mojave Desert, exploration for mineral deposits soon produced new strikes in places such as Calico in San Bernardino County in 1881. During the next several decades, many such mining camps were established in the eastern counties, most of these camps remained in existence only for a short time.

In the 20th Century, the region underwent a metamorphosis from a primarily agricultural region into an urban metropolis. Southern California has attracted and maintained millions of people and employment opportunities and has developed into the second-largest metropolitan region in the country.

The activities and achievements of the recent past have generated many important cultural resources throughout the region. **Table 3.4-3** lists California Historical Landmarks from the American Period.

TABLE 3.4-2: CALIFORNIA HISTORIC LANDMARKS OF THE MEXICAN PERIOD (1822-1848)

CA Historic Landmark No.	Site Name	General Location	Year
42	San Bernardino Asistencia	Redlands	1830
44	Mormon Stockade	San Bernardino	1839
102	Site of Louis Rubidoux House	Rubidoux	1844
115	Olivas Adobe	Ventura	1837, 1849
121	Agua Mensa	Colton	1845
127	Casa de Pio Pico	Whittier	1830's?
144	Church of Los Angeles	Los Angeles	1822
151	Campo de Cahuenga	North Hollywood	1847
152	Dominguez Ranch House	Compton	1826
167	La Mesa Battlefield	Vernon	1847
168	Oak of the Golden dream	Newhall	1842
185	Serrano Adobe Site	South of Corona	1824
189	Dana Point	Dana Point	1835
199	Serrano Adobe	El Toro	1842
217	Black Star Canyon Indian Village Site	Near Silverado	1878
224	Site of Third Serrano House	Southeast of Corona	1840's
226	Bernardo Yorba Ranch Site	Yorba Linda	1834
227	Diego Sepulveda Adobe Costa Mesa	Costa Mesa	Late 1820s
301	Site of Lugo Adobe	Los Angeles	1840's
303	Site of Old Rubidoux Grist Mill	Rubidoux	1846-7
360	Tapia Adobe	Rancho Cucamonga	1839
362	Romulo Pico Adobe	Mission Hills	1834
368	Hugo Reid Adobe	Arcadia	1839
385	Rio San Gabriel Battlefield	Montebello	1847
490	Cucamonga Rancho Winery	Rancho Cucamonga	1839
528	Yucaipa Adobe	Yucaipa	1842
553	Rancho Camulos	2 miles E of Piru	1839
637	Catalina Adobe	Glendale	1830's
756	Sycamore Tree	4 miles E of Santa Paula	1846
920	Casa de San Pedro	San Pedro	1823
942	Site of Rancho Chino Adobe	Chino	1841
944	Site of Fort Romualdo Pacheco	West of Imperial	1822
963	Mojave Road	Northeast of Barstow	1826
978	Rancho Los Cerritos	Long Beach	1844
979	Rancho Simi	Simi Valley	1842
1005	Santa Rosa Rancho	Murrietta	1846

SOURCE: California Department of Parks and Recreation, Office of Historic Preservation, California State Historic Landmarks listed by County, available at: *http://ceres.ca.gov/geo_area/counties/lists/landmarks_county.html*, accessed August 1, 2011.

TABLE 3.4-3: CALIFORNIA HISTORIC LANDMARKS OF THE AMERICAN PERIOD (1849 TO PRESENT)			
CA Historic Landmark No.	**Site Name**	**General Location**	**Year**
20	Parent Orange Tree	Riverside	1870
96	Mormon Road	W of Crestline	1851
112	City of Anaheim	Anaheim	1857
147	Banning Park	Wilmington	1850's
150	Brand Park (Memory Garden)	Los Angeles	1920
159	Pico Hotel	Los Angeles	1869-1870
160	Oldest House in Hollywood	Hollywood	1870's
169	Drum Barracks	Wilmington	1862
170	Hancock Park La Brea	Los Angeles	1916
171	Merced Theater	Los Angeles	1870
172	Pioneer Oil Refinery	Newhall	1870
182	Tumco Mines	5 miles NE of Ogilby	1884
188	Butterfield Stage Station	S of Corona	1858
191	Yorba-Slaughter Adobe	S of Chino	1850-1853
193	Picacho Mines	N of Winterhaven	1852
194	Mountain Springs Stage Station	Mountain Springs	1850's
198	Old Landing	Newport Beach	1870
201	Pioneer House of the Mother Colony	Anaheim	1857
202	Silverado	Silverado	1878
203	Red Hill	Santa Ana	1893
205	Modjeska's Home	NE of Lake Forest	1888
218	Barton's Mound	Irvine	1857
219	Anaheim Landing	Seal Beach	1857
225	Flores Peak	Modjeska Canyon	1857
228	Carbondale	Silverado	1878
235	Casa de San Rafael	Glendale	1875
289	First Home of Pomona College	Pomona	1887
367	Lucky Baldwin's Cottage	Arcadia	1865
372	Adobe de Palomares	Pomona	1881
373	Old Salt Lake	Redondo Beach	1850s
380	Site of Diego Sepulveda Adobe	San Pedro	1854
381	Old Whaling Station	Rancho Palos Verdes	1850's
384	Timms' Point and Landing	San Pedro	1852
386	La Casa de Carrion	La Verne	1864
514	Pomona Power Plant	Claremont	1892
516	Well No. CSO	Newhall	1876
516-2	Mentryville	Newhall	1876
531	Lummis House	Los Angeles	1895
536	Original Building of the University of Southern California	Los Angeles	1880
554	DeMille Studio	Hollywood	1913
567	St. Vicent's Place	Los Angeles	1868
573	Sycamore Grove	W of Devore	1851
576	Santa Fe/Salt Lake Trail	N of San Bernardino	1917
577	Mormon Trail Monument	N of San Bernardino	1851
578	Stoddard-White Monument	N of San Bernardino	1849
579	Daly Road Monument	E of Rim Forest	1870
580	Alamitos 1	Long Beach	1921
590	Lang Station	E of Canyon Country	1876
617	Fort Benson	Colton	1856-1857
619	Holcomb Valley	NE of Big Bear	1860
622	Harry Wade Exit Route	Near Baker	1849

TABLE 3.4-3: CALIFORNIA HISTORIC LANDMARKS OF THE AMERICAN PERIOD (1849 TO PRESENT)			
CA Historic Landmark No.	**Site Name**	**General Location**	**Year**
632	Old Short Cut	Angeles National Forest	1900
646	Grave of George Carlambo	Whittier	1867
649	Harry Wade Exit Route	30 miles N of Baker	1849
653	The Cascades	San Fernando Valley	1913
656	Bella Union Hotel Site	Los Angeles	1858
664	Heritage House	Compton	1869
668	Lyon Station	Newhall	1855
669	Gov. Stoneman Adobe, Los Robles	San Marino	1880
681	Paradox Hybrid Walnut Tree	Whittier	1907
688	Lyons Station Stagecoach Stop	Newhall	1850s
716	Griffith Ranch	San Fernando	1912
717	Angeles National Forest	La Canada	1892
717	Angeles National Forest	San Bernardino Mountains	1892
718	First International Air Meet	Carson	1910
725	Old Bear Valley Dam	W of Big Bear	1884
729	Old Maizeland School	Buena Park	1868
730	Old Plaza Firehouse	Los Angeles	1884
737	Chimney Rock	Lucerne Valley	1867
738	Corona Founders Monument	Corona	1886
744	Butterfield State Station Site	Los Angeles	1858
749	Saahatpa	Brookside Rest Area	1851
761	Mission Inn	Riverside	1876
774	Searles Lake Borax Discovery	Trona	1862
775	Site of First Water-to-Water Flight	Newport Beach	1912
782	Calico	Near Yermo	1881
789	Site of the Los Angeles Star	Los Angeles	1851
794	McFadden Wharf	Newport Beach	1888
806	Fort Yuma	Winterhaven	1849
808	Camp Salvation	Calexico	1849
822	First Jewish Cemetery	Los Angeles	1854
837	Santa Ana Courthouse	Santa Ana	1900
840	Old Santa Monica Forestry Station	Los Angeles	1887
845	Plank Road	W of Winterhaven	1915?
847	Ventura County Courthouse	Ventura	1913
859	Von Schmidt Boundary	N of Needles	1873
871	The Gamble House	Pasadena	1908
874	Workman Home	Industry	1842
881	Site of Port of Los Angeles Long Wharf	Pacific Palisades	1893
887	Pasadena Playhouse	Pasadena	1924
892	Harvey House	Barstow	1893
894	S.S. Catalina	Lost	1924
912	Glendora Bougainvillea	Glendora	1901
918	Olinda	Brea	1897
919	St. Francis Dam Disaster Site	N of Saugus	1928
933	Site of Llano Colony	Llano	1916?
934	Japanese Detention Center	Arcadia	1942
939	Charley's World of Lost Art	Andrade	1967
939	Old Trapper's Lodge	Woodland Hills	1951
939	Hula Ville	4 miles NW of Yermo	1954
939	Possum Trot	6 miles NW of Hesperia	1955
939	Grandma Prisbrey's Bottle Village	Simi Valley	1956

TABLE 3.4-3: CALIFORNIA HISTORIC LANDMARKS OF THE AMERICAN PERIOD (1849 TO PRESENT)			
CA Historic Landmark No.	**Site Name**	**General Location**	**Year**
943	Cornelius and Mercedes Jenson Ranch	Rubidoux	1854
947	Reform School Juvenile Offenders (F.C. Nelles)	Whittier	1891
948	Site of Blythe Intake	N of Blythe	1877
950	U.S. Rabb Experimental Station	Fontana	1928
959	Balboa Pavilion	Balboa	1905
960	Los Angeles Memorial Coliseum	Los Angeles	1923
961	Harold Lloyd Estate	Beverly Hills	1929
963-1	Camp Cady	24 miles N of Barstow	1860
966	Adamson House	Malibu	1926
975	El Monte-1st So. Cal. Settlement by U.S. Immigrants	El Monte	1850s
985	Camp Pilot Knob	Felicity	1943
985	Camp Young	28 miles E of Indio	1942
985	Camp Coxcomb	45 miles E of Indio	1942
985	Camp Granite	45 miles E of Indio	1942
985	Camp Iron Mountain	45 miles E of Indio	1942
985	Camp Clipper	37 miles W of Needles	1942
985	Camp Ibis	8 miles E of Needles	1942
988	Pacific Asia Museum	Pasadena	1929
989	Soviet Transpolar Landing Site	San Jacinto	1937
990	Christmas Tree Lane	Pasadena	1920
992	Site of Contractor's General Hospital	Desert Center	1933
993	Watts Towers	Los Angeles	1955
994	A.K. Smiley Public Library	Redlands	1898
996	Union Oil Company Building	Simi Valley	1890
997	Tuna Club of Avalon	Avalon	1898
1004	Old Town Irvine	Irvine	1887
1006	Beale's Cut Stagecoach Pass	Santa Clarita	1862
1009	Ramona Bowl	Hemet	1923
1011	Ennis House	Los Angeles	1924
1014	Long Beach Marine Stadium	Long Beach	1932
1015	Richard Nixon Birthplace	Yorba Linda	1912
1018	Manhattan Beach State Pier	Manhattan Beach	1920
1019	Kimberly Crest	Redlands	1897
1021	Liberty Hill Site	San Pedro	1923
1028	Madonna of the Trail	Upland	1929
1034	Tecolote Rancho	Holtville	1907

SOURCE: California Department of Parks and Recreation, Office of Historic Preservation, California State Historic Landmarks listed by County, available at: *http://ceres.ca.gov/geo_area/counties/lists/landmarks_county.html*, accessed August 1, 2011.

Historical Resources

The location of historical sites are open to the general public and are listed in registries found at the federal, State, county, and city levels. Additionally, registries are maintained by regional and local historical societies.

Federal Registers. The National Register of Historic Places (NRHP) is the nation's official list of cultural resources worthy of preservation. The NRHP is made up of all historic areas in the National Park System, National Historic Landmarks (NHL), and properties across the country that have been nominated by governments, organizations, and individuals because they are significant to the nation, to a state, or to a community. The NRHP is authorized under the National Historic Preservation Act of 1966. The NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and

protect our historic and archaeological resources. Properties listed in the NRHP include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. The NRHP is administered by the National Park Service, which is part of the U.S. Department of the Interior. There are over 85,000 listings in NRHP of which 751 are located in the SCAG region.

NHL are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States. NHL is authorized under Section 213 the National Historic Preservation Act of 1966. There are over 2,400 listings in the NHL of which 28 are located in the SCAG region.

Table 3.4-4 summarizes the number of NRHPs and NHLs found in each County in the SCAG region. Table CUL-1 in the Cultural Resource Technical Appendix includes the sites in the SCAG region listed on the NRHP. Table CUL-2 includes the NHL.

TABLE 3.4-4: NATIONAL REGISTERED PLACES AND LANDMARKS IN SCAG REGION

County	Registered Places	Landmarks
Imperial	10	1
Los Angeles	479	20
Orange	114	2
Riverside	55	2
San Bernardino	57	2
Ventura	36	1
Total	**751**	**28**

SOURCE: National Park Service, National Historic Landmarks Program, National Historic Landmarks Survey, available at: *http://www.nps.gov/nhl/designations/l istsofNHLs.htm,* accessed August 1, 2011; National Park Service, National Register of Historic Places, NPS Focus, available at: *http://nrhp.focus.nps.gov/natreghome.do?searchtype=natreghome*, accessed August 1, 2011.

State Registers. California Historical Landmarks (CHLs) are buildings, structures, sites, or places that have been determined to have statewide historical significance. The resource also must be approved for designation by the County Board of Supervisors or the City/Town Council in whose jurisdiction it is located; be recommended by the State Historical Resources Commission; and be officially designated by the Director of California State Parks. There are 1,044 listings in the CHL of which 212 are located in the SCAG region. **Table 3.4-5** contains a summary of the period and number of Historical Places and Landmarks in SCAG region, found on the CHL register. Table CUL-1 in the Cultural Resource Technical Appendix lists the CHLs located in the SCAG region.

TABLE 3.4-5: CALIFORNIA HISTORICAL LANDMARKS IN SCAG REGION (SUMMARY TABLE)

County	Pre-European Period	Spanish Period	Mexican Period	American Period	Total
Imperial	0	3	1	9	13
Los Angeles	3	16	11	66	96
Orange	0	2	4	19	25
Riverside	4	5	5	14	28
San Bernardino	2	5	7	23	37
Ventura	0	6	3	4	13
Total	**9**	**37**	**31**	**135**	**212**

SOURCE: California Department of Parks and Recreation, Office of Historic Preservation, California State Historic Landmarks listed by County, available at: *http://ceres.ca.gov/geo_area/counties/lists/landmarks_county.html*, accessed August 1, 2011.

California Points of Historical Interest (PHI) are sites, buildings, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. There are 850 PHI listings, of which 285 are located in

the SCAG region. **Table 3.4-6** contains a summary of the number of Points of Historical Interest found in each county in the SCAG region. Table CUL-1 in the Cultural Resource Technical Appendix lists the Points of Historical Interest located in the SCAG region.

TABLE 3.4-6: CALIFORNIA POINTS OF HISTORICAL INTEREST IN SCAG REGION

County	Points of Historical Interest
Imperial	4
Los Angeles	65
Orange	21
Riverside	72
San Bernardino	119
Ventura	4
Total	**285**

SOURCE: California State Parks, Office of Historic Preservation, California Historical Resources listed by County, available at: http://ohp.parks.ca.gov/listed_resources/, accessed August 1, 2011.

These registers are administered by the California Office of Historic Preservation (OHP) and the State Historical Resources Commission (SHRC), which are a part of the California Department of Parks and Recreation.

City and County Registers. Registries may also be maintained by county and city commissions. Examples of these types of organizations include the Riverside County Historical Commission, the Santa Ana Historic Resources Commission, and the Santa Monica Landmarks Commission.

Local Registers. Local groups have also created registries within their area of interest, generally at the community level. An example is Ontario Heritage, a local non-profit organization that aims to protect the historic and cultural resources of Ontario, California.

Archaeological Resources

Archaeological resources are the physical remains of past human activity, and humans have occupied Southern California for thousands of years. The SCAG region is rich in archaeological resources that range from the early prehistoric period to the historic period. As of August 2011, over 68,000 archaeological resource locations have been identified in the SCAG region. The location of known archaeological sites is confidential to help prevent scavenging of artifacts. Detailed information, especially their location, is considered proprietary by State law, therefore, **Table 3.4-7** lists these resources only by county.

TABLE 3.4-7: ARCHAEOLOGICAL SITE DISTRIBUTION BY COUNTY

County	Approximate Number of Archaeological Sites
Imperial	11,720
Los Angeles	4,196
Orange	1,710
Riverside	19,858
San Bernardino	29,480
Ventura	1,806
SCAG Region Total	**68,770**

SOURCE: Imperial County: Jamie Lennox, South Coastal Information Center, August 3, 2011; San Bernardino County: Robin Laska, San Bernardino Archaeological Center, August 3, 2011; Riverside County: Dr. M. C. Hall, Eastern Information Center, August 8, 2011; Los Angeles, Orange, and Ventura Counties: Stacy St. James, South Central Coastal Information Center, August 10, 2011.

Due to the proprietary nature of archaeological information, the exact location of most of these locales cannot be discussed. However, some of the sites have been made public in county, regional, State, and federal parks, or listed on public registers. These include:

- The site of the Puvunga Indian Village (NR) Los Angeles County
- Vasquez Rocks (NR) Los Angeles County
- The Black Star Canyon Indian Village Site (CHL-217) Orange County
- The Fairview Indian Site (NR) Orange County
- Desert Intaglios (CHL-101) Riverside County
- Site of the Indian Village of Pochea (CHL-104) Riverside County
- Carved Rock (CHL-187) Riverside County
- Painted Rock (CHL-190) Riverside County
- The Hemet Maze (CHL-557) Riverside County
- The Calico "Early Man" Site San Bernardino County
- Anacapa Island Archaeological District (NR) Ventura County

The SCAG region was occupied during both the prehistoric and protohistoric periods; therefore, archaeological sites are widespread and numerous. Rock outcrops, river and stream drainages, and coastal strips were often prime locations for Native American village sites or processing camps. These locations now include highly urbanized locations, such as cities, and undeveloped areas of the high desert. Often archaeological sites are covered by three feet or more of topsoil; however, it is possible that construction may not disturb the surface soils by more than a foot or two, thereby protecting remains even after an area has been fully urbanized. In 1998, a large undisturbed Native American burial ground, dating from the Protohistoric Period, was exposed during construction at the ARCO Refinery in Los Angeles. The refinery had been there for seventy-five years, yet the burial level was located under three to five feet of flood deposits from the nearby Los Angeles River.

Paleontological Resources

Paleontological resources are fossilized remains of non-human organisms that lived in the region in the geologic past. Paleontological sites and fossils are non-renewable resources that are important in our understanding of the prehistory and the geologic development of Southern California. Many paleontological sites include remains of species that are now extinct. Paleontological sites are predominantly found in sedimentary rock deposits, and most of the Los Angeles Basin is composed of these sedimentary deposits. Paleontological resources are most easily found in areas that have been uplifted and eroded, and they can be found anywhere that subsurface excavation is being carried out. Ancient marine fossils have been found both in the Santa Monica Mountains, particularly in exposed canyon areas, streambeds, along road cuts, and beneath the streets of Los Angeles during storm drain and subway construction.

The following types of paleontological resources are known to exist in the SCAG region:

- True Fossils – Lithified or replaced remains of plants and animals preserved in a rock matrix (e.g., microfossils, shells, animal bones and skeletons, and whole tree trunks);
- Trace Fossils – Molds, casts, tracks, trails and burrow impressions made in soft clays and muds which subsequently were turned to stone, preserving the images of past life (e.g., shells, footprints, leaf prints, and worm tubes);
- Breas – Seeps of natural petroleum that trapped extinct animals and preserved and fossilized their remains.

Both marine and land vertebrate and invertebrate fossils are found in the SCAG region.[7] An associated formation is the matrix in which most fossils are found. These formations are different from modern soils and cannot be correlated with soil maps, which depict a thin veneer of surface soils. Geologic formations

[7]Bedrossian T. L. (1975), Vertebrate Fossils and the History of Animals with Backbones, California Geology, 28(11), 243-259.

form complex relationships below the surface and may range in thickness from a few feet to hundreds of thousands of feet. Geologic maps (available through the U.S. Geological Survey [USGS] and the California Geological Survey [CGS]) show the surface expression of geologic formations along with other geologic features such as faults, folds, and landslides. Although sedimentary formations were initially deposited one atop the other over time the layers have been squeezed, tilted, folded, cut by faults and vertically and horizontally displaced, so that today, any one rock unit does not usually extend in a simple horizontal layer. A sensitive formation bearing fossils can be found at the surface in a rock outcrop that same formation may extend many feet down into the ground and also extend for miles just below the surface. Thus, predicting which areas are paleontologically sensitive is difficult.

Paleontologists consider all vertebrate fossils to be of significance. Other types of fossils are considered significant if they represent a new record, new species, an oldest occurring species, the most complete specimen of its kind, a rare species worldwide, or a species helpful in the dating of formations.

Fossil bearing sedimentary formations and crystalline basement rocks (metamorphic and plutonic) overlain by sedimentary and volcanic rocks are prevalent throughout Southern California. Although the exact locations of these formations are considered proprietary to help prevent the removal or destruction of these important, non-renewable resources, **Table 3.4-8** identifies the general location of some of the more significant fossil localities for the SCAG region.

TABLE 3.4-8: SIGNIFICANT FOSSIL LOCALITIES IN THE SCAG REGION

Location	Fossil Type	Formations
Octillo Area (Shell Canyon, Coyote Mountains, Painted Gorge, Yuma Buttes)	Invertebrates	Imperial
Plaster City	Freshwater invertebrates	Lake Cahuilla Beds
La Brea Tar Pits	>500,000 specimens, >200 types of animals	
Palos Verdes Peninsula	Mastadon, mammoth, horse, camel, sloth	Palos Verdes Sand
Palos Verdes Peninsula	Grey whale	San Pedro
Palos Verdes Peninsula	Fish, birds, sea lion, plants, baleen whale, horse, sloth, sea otter, mammoth, mastodon, bison, camel, tapir	Monterey Shale
Palos Verdes Peninsula	Dolphin	Monterey Shale
Santa Monica Mountains (Topanga Canyon)	Cypraeid gastropod	Topanga
Santa Monica Mountains (Old Topanga Canyon Road, Piuma Road)	Numerous Fossils	Topanga
Mint Canyon	Oldest hawk in California	Tick Canyon
Mint Canyon	Horse, elephant, camel	Mint Canyon
Puente Hills (Hacienda Heights)	Fish	Puente
Puente Hills (Diamond Bar)	Fish and leaves	Puente
Buena Park (Ralph B. Clark Paleontological Park)	Ice age mammals including Imperial Mammoth	La Habra
Laguna Hills/Dana Point	Baleen whale (largest and most complete skull)	Capistrano
Laguna Hills/Dana Point (Costeau Park)	Terrestrial mammal	Capistrano
San Joaquin Hills, Laguna Niguel	Dolphin	Monterey
Newport Bay East Bluffs	Invertebrates	Palos Verdes Sand
Santa Ana Mountains (Eastern Carriort)	76 Localities with various species	Ladd, Sespe-Vacqueros, Tapanga, Silverado, Santiago, Puente
Santa Ana Mountains (Robinson Ranch/Dove Canyon)	Wood. Leaves, ammonites	Silverado
Santa Ana Mountains (Black Star and Silverado Canyons)	Invertebrates	Ladd
Santa Ana Mountains (Gypsum Canyon)	Invertebrates, shark teeth	Topanga

TABLE 3.4-8: SIGNIFICANT FOSSIL LOCALITIES IN THE SCAG REGION		
Loma Linda to Banning (The Badlands)	Vertebrate fossil remains such as horse, camel and rhinoceros	San Timoteo
Soboba Hot Springs	80 varieties of fossilized chaparral and woodland plant species	Soboba
Lake Elsinore	Plants	Silverado
California Oaks	Horse, coyote, rodents, reptiles, amphibians	Unnamed sandstone
Margarita Creek	Horse fossils	Pauba
Bernasconi Hills	Mammoth, horse, saber toothed cat	Lakeview Hot Springs
Perris	Large oreodonts	Lake Matthews
Temecula (I-15 & I-79)	Vertebrate fossils	Temecula Arkose
Barstow, Rainbow Basin	Horse, camel	Barstow
Cajon Pass	Pleiosaurs	San Francisquito
Cajon Valley	Small mammals	Crowder, Punchbowl
Cady Mountains	Oldest tertiary vertebrates in Mojave	Hector
Badlands east of Barstow	Vertebrates	Manix
Boron Open Pit Mine	Lizards	Kramer Beds
Lava Mountains	Lizards, rodents	Bedrock Spring
Red Rock Canyon	Vertebrates	Dove Spring
Cache Peak	42 taxa including microvertebrates	Bopesta
Hills west of Mojave	23 mammalian taxa including 12 of microinvertebrates	Homed Toad
Lone Pine Road near I-15	Whales	Vaqueros
Calico Mountains	Nonmarine insects, invertebrates	Barstow
Marble Mountains	Trilobites, brachiopods	Latham Shale, Chambless Limestone
Providence Mountains	Trilobites, brachiopods	Latham Shale
Kelso Mountains	Trilobites	Latham Shale
Striped Mountains	Coral and invertebrates	Bird Spring
Soda Mountains	Coral and brachiopods	Bird Spring
Las Posas Hills	Echinoids, small mammals, horse, saber, cat, rhino	Las Posas, Saugas
South Mountain	Small mammals, oreodont	Saugus
Tapo Ranch, Pearson Ranch	Lemurs, carnivores, rhino, monkey	Sespe
Balcom Canyon, Grimes Canyon	Plants, fish, insects	Monterey
Pine Mountain	Invertebrates	Santa Margarita
Rincon Beach	Pine Cones	Pico
Simi Wash	Invertebrates	Las Llajas
Pitas Point	Invertebrates	Santa Barbara
SOURCE: Robin Laska, San Bernardino Archaeological Center, August 3, 2011; Dr. Mcleod, Collections Manager, Natural History Museum of Los Angeles County, August 4, 2011; Meredith A. Rivin, M.S. Associate Curator of Paleontology, The Cooper Center CSU Fullerton, August 2, 2011.		

THRESHOLDS OF SIGNIFICANCE

The 2012-2035 RTP/SCS would have a significant impact related to cultural resources if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5;
- Directly or indirectly destroy a unique paleontological resources or site or unique geologic feature; and/or
- Disturb any human remains, including those interred outside of formal cemeteries.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the 2012-2035 RTP/SCS on historic, archaeological, and paleontological resources in the SCAG region.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of cultural resources includes a comparison of the expected future conditions with the Plan and the expected future conditions if no Plan were adopted (No Project). This evaluation is not included in the determination of the significance of impacts (which is based on comparison to existing conditions); however, it provides a meaningful perspective on the effects of the 2012-2035 RTP/SCS.

Determination of Significance

The methodology for determining the significance of cultural impacts compares the existing conditions to the future 2012-2035 RTP/SCS conditions, as required by CEQA Guidelines Section 15126.2(a). The known historical, archaeological, and paleontological resources located within the SCAG region were evaluated using the criteria set forth by the OHP, the California Register of Historic Resources, and the CEQA Guidelines. The research analysis was limited to State and federally recognized historic resources and landmarks, and does not include landmarks of local significance.

All of the counties within the SCAG region contain archaeological localities and are rich with fossil bearing sedimentary formations. All areas within the region have the potential for yielding, as yet undiscovered, archaeological and paleontological resources and human remains. Over 32,000 archaeological and historic locations have been identified in the SCAG region. Each of these sites is documented at the Archaeological Information Center, which holds location information on archaeological sites for each region in California. Paleontological sites are also numerous in the SCAG region. The development of new transportation facilities may affect archaeological and paleontological resources, primarily through the disturbance of buried resources. Frequently, these resources are previously unidentified. Therefore, any excavation in previously undisturbed soil or geologic formation has the potential to impact archaeological and paleontological resources.

The development of new transportation facilities may affect historic architectural resources (structures 50 years or older), either through direct effects to buildings or through indirect effects to the area surrounding a resource if it creates a visually incompatible structure adjacent to a historic structure. Impacts to historic resources fall into three categories: 1) direct disturbance of buried resources, 2) direct impact or alteration of structures, and 3) indirect impacts to structures, such as vibration and corrosive air contaminants, and creation of a visually incompatible environment. All counties in the SCAG region contain a large number of historic properties and historic residential districts (**Tables 3.4-4** through **3.4-6**); therefore, the potential for impacts to historic properties is significant. Improvements within existing rights-of-way are less likely to affect historical architectural resources. However, new highway segments through historic districts would

constitute a significant impact. Also, reducing buffer zones between transportation corridors and reduction of historic resources through lane widening could cause significant impacts.

Since this document analyzes impacts to cultural resources on a program level only, project-level analysis of impacts must be undertaken as appropriate.

IMPACTS

Impact 3.4-1: Potential to cause a substantial adverse change in the significance of a historical resource.

Unrecognized historic resources are those structures that exist whose historic value has not previously been assessed or documented. In more remote areas, structures of historic importance may not be currently listed on State or federal registers and even in urban areas some jurisdictions have not undertaken a detailed inventory of potential resources. Therefore as part of the evaluation of all project sites the potential for impacts to historic resources should be reviewed.

In instances where buildings 50 years or older are located on or adjacent to the site, it is important to treat these structures as historic resources, if they meet the criteria that would make them eligible for the NRHP or California State Historic Landmarks. In general, for new construction, the evaluation of the potential for indirect and direct impacts to historic resources should extend at least 1,000 feet from new construction. This should be applied in evaluating impacts during project level analyses.

Types of projects that would impact historic resources include projects that entail the development of new lanes or tracks and in some instances acquisition of new right-of-ways, and arterials and interchange projects that entail the development of new lanes and right-of-way acquisition. Improvements proposed in existing "rights of way," such as HOV lanes, HOT lanes, BRT and goods movement capacity enhancement projects, mixed flow lanes, and "right of way" maintenance (such as pot-hole repair) would have limited potential to impact historic resources. The 2012-2035 RTP/SCS includes transportation investments and land use policies that would focus development in High Quality Transit Areas (HQTAs). Many HQTAs are located in older urban centers where structures of architectural or historical significance are likely to be located. This could result in a significant impact to historic resources. Many of the planned projects include the construction of additional lanes and highway arterials, see Chapter 2.0 Project Description, and Appendix B: 2012-2035 RTP/SCS Project List. Construction and implementation of these projects, as well as construction of development could impact the physical and aesthetic integrity of historic buildings and communities, as well as negatively impact the structures through increased levels of corrosive air contaminates and vibrations, which may damage the exterior of historic buildings. Implementation of Mitigation Measures **MM-CUL1** through **MM-CUL4** would reduce historical resource impacts; however, impacts would remain significant.

Impact 3.4-2: Potential to cause a substantial adverse change in the significance of an archaeological resource.

The OHP defines an archaeological "site" as consisting of three or more related resources discovered in one locality. In the event of archaeological discovery, the resources are collected, documented, and curated at an educational institution, such as a school or a museum.

A unique archaeological resource includes artifacts or sites that meet any one or all of the following criteria:

- It has made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States;
- It is associated with the lives of persons important to California's past;

- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; and/or
- It has yielded, or may be likely to yield, information important to the prehistory or history of California.

The 2012-2035 RTP/SCS includes transportation projects that have the potential to impact archaeological resources because they could take place in previously undisturbed areas. Improvements, and modifications to existing rights-of-way, such as HOV lanes, HOT lanes, bus-ways and capacity enhancement facilities, mixed flow lanes, other transportation facilities and right-of-way maintenance, would have less potential to impact archaeological resources because these project locations have previously been disturbed. However, construction of additional lanes, would potentially impact archaeological resources, if it would entail grading, trenching, excavation, and/or soil removal of any kind, in an area not previously disturbed. In addition, construction of new transportation facilities has the potential to impact archaeological resources where previous disturbance has not occurred. The 2012-2035 RTP/SCS also includes land use policies that aim to focus growth in HQTAs that are generally urban and therefore previously disturbed. In most cases the potential for discovering buried archeological resources in previously disturbed areas is low as any resources that may have existed have likely been either removed or destroyed during previous excavations. Nonetheless, some projects associated with the 2012-2035 RTP/SCS would be expected to occur on previously undisturbed sites. The potential to discover previously undiscovered archeological resources would be a significant impact.

The locations of Native American villages, burial grounds, and other archaeological sites are confidential. Archaeologists do not reveal information for these locales in order to preserve the integrity of these sites. Particularly the unknown sites run the risk of being impacted, as their locations are unknown and cannot be avoided prior to surveys. As described in the cultural setting, the region has a rich Native American history and therefore it is likely that projects proposed as part of the 2012-2035 RTP/SCS would disturb Native American Sites and, therefore, this impact would be significant. Implementation of Mitigation Measures **MM-CUL5** through **MM-CUL10** would reduce archaeological resource impacts; however, impacts would remain significant.

Impact 3.4-3: Potential to directly or indirectly destroy unique paleontological resources or sites or unique geological features.

Excavation related to construction of projects proposed in the 2012-2035 RTP/SCS as well as development undertaken consistent with the Plan could cause unearthing of buried paleontological resources, such as true fossils, fossil casts, and breas. Construction occurring in previously undisturbed areas and deep excavation activities would have the greatest likelihood to affect paleontological resources. However, construction activities for each transportation improvement generally occur within 150 feet on either side of any improvement. In addition development is anticipated throughout the region (although focused in HQTAs). Excavation and soil removal of any kind, irrespective of depth, has the potential to impact resources of paleontological significance. The extensive distribution of resources makes it difficult to predict which areas are paleontologically sensitive. Similar to Impact 3.4-2, construction and excavation activities relating to this project pose a potentially significant impact to paleontological materials.

New roadways and transit facilities can also permanently alter unique geologic features, particularly in rock outcroppings, canyons, coastal areas, and mountain passes. Many, of the projects proposed in the 2012-2035 RTP/SCS would occur in urbanized portions of the SCAG region, particularly in HQTAs (over half of anticipated development growth would occur in HQTAs). Nonetheless, new lanes and transit projects require earthwork and even in urban areas impacts could occur to existing natural and unique geologic features and paleontological resources. Implementation of Mitigation Measures **MM-CUL11** through **MM-CUL14** would reduce paleontological resource impacts; however, impacts would remain significant.

Impact 3.4-4: Construction and implementation of projects from the 2012-2035 RTP/SCS could disturb human remains, including those interred outside of formal cemeteries.

Humans have occupied the six-county SCAG region for at least 10,000 years and it is not always possible to predict where human remains may occur outside of formal burials. Therefore, it is possible that excavation and construction activities, regardless of depth, may yield human remains that may not be interred in marked, formal burials. Construction activities for each transportation improvement would generally be within 150 feet on either side of any improvement and could result in a significant impact relative to the discovery of human remains. Similarly construction of development projects throughout the region has the potential to encounter human remains. Under CEQA, human remains are protected under the definition of archaeological materials as being "any evidence of human activity". Human remains are also protected under NAGPRA, which was enacted to provide protection to Native American graves, as well as culturally affiliated items, associated funerary objects, unassociated funerary objects, sacred objects, and objects of cultural patrimony.

The 2012-2035 RTP/SCS transportation projects have the potential to yield previously undiscovered human remains, because some projects would take place in previously undisturbed or areas with only little previous disturbance. Excavation and soil removal of any kind, irrespective of depth, has the potential to encounter human remains. Implementation of Mitigation Measures **MM-CUL15** and **MM-CUL16** would reduce human remains impacts; however, impacts would remain significant.

Cumulative Impacts 3.4-5: Potential to contribute to a cumulatively considerable loss of cultural resources.

Urbanization in the SCAG region will increase substantially by 2035. The 2012-2035 RTP/SCS, by increasing mobility and targeting growth in HQTAs will influence the pattern of this urbanization. The 2012-2035 RTP/SCS's influence on growth contributes to regional impacts on existing and previously undisturbed and undiscovered cultural resources, is described in Impacts 3.4-1 through 3.4-4 above. Impacts of the Plan would combine with impacts in other areas of Southern California to contribute to a cumulative loss of cultural resources in California. Implementation of Mitigation Measure **MM-CUL17** would reduce cumulative impacts; however, impacts would remain significant.

MITIGATION MEASURES

Mitigation Measures **MM-CUL1** through **MM-CUL16** can and should be implemented by project sponsors (for both development and transportation projects) as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions. Mitigation Measure **MM-CUL17** identified below shall be implemented by SCAG over the lifetime of the 2012-2035 RTP/SCS.

Historical Resources

MM-CUL1: As part of the appropriate project/environmental review of individual projects, project sponsors can and should identify potential impacts to historic resources. A record search at the appropriate Information Center should be conducted to determine whether the project area has been previously surveyed and whether historic resources were identified.

MM-CUL2: If indicated as necessary by a records search, prior to construction activities, project sponsors can and should obtain a qualified architectural historian to conduct historic architectural surveys as recommended by the Information Center. In the event the records indicate that no previous survey has been conducted, the Information Center will make a recommendation on whether a survey is warranted based on the sensitivity of the project area for historical resources within 1,000 feet of the project.

MM-CUL3: Project sponsors can and should comply with Section 106 of the National Historic Preservation Act (NHPA) including, but not limited to, projects for which federal funding or approval is required for the individual project. This law requires federal agencies to evaluate the impact of their actions on resources included in or eligible for listing in the National Register. Federal agencies must coordinate with the State Historic Preservation Officer in evaluating impacts and developing mitigation. These mitigation measures may include, but are not limited to the following:

- Where appropriate, project sponsors should employ design measures to avoid historical resources and undertake adaptive reuse where appropriate and feasible. If resources are to be preserved, as feasible, project sponsors should carry out the maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation or reconstruction in a manner consistent with the Secretary of the Interior's Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings. If resources would be impacted, impacts should be minimized to the extent feasible.

- Where feasible, noise buffers/walls and/or visual buffers/landscaping should be constructed to preserve the contextual setting of significant built resources.

MM-CUL4: Project sponsors can and should secure a qualified environmental agency and/or architectural historian, or other such qualified person to document any significant historical resource(s), by way of historic narrative, photographs, and architectural drawings, as mitigation for the effects of demolition of a resource. However, such documentation will not mitigate the effects to less than significant.

Archaeological Resources

MM-CUL5: As part of the appropriate project/environmental review of individual projects, project sponsors can and should consult with the Native American Heritage Commission (NAHC) to determine whether known sacred sites are in the project area, and identify the Native American(s) to contact to obtain information about the project site.

MM-CUL6: Prior to construction activities, project sponsors can and should obtain a qualified archaeologist to conduct a record search at the appropriate Information Center of the California Archaeological Inventory to determine whether the project area has been previously surveyed and whether resources were identified.

MM-CUL7: Prior to construction activities, project sponsors can and should obtain a qualified archaeologist or architectural historian (depending on applicability) to conduct archaeological and/or historic architectural surveys as recommended by the Information Center. In the event the records indicate that no previous survey has been conducted, the Information Center will make a recommendation on whether a survey is warranted based on the sensitivity of the project area for archaeological resources.

MM-CUL8: If the record search indicates that the project is located in an area rich with cultural materials, project sponsors can and should retain a qualified archaeologist to monitor any subsurface operations, including but not limited to grading, excavation, trenching, or removal of existing features of the subject property.

MM-CUL9: Construction activities and excavation can and should be conducted to avoid cultural resources (if identified). If avoidance is not feasible, further work may be needed to determine the importance of a resource. Project sponsors shall obtain a qualified archaeologist familiar with the local archaeology, and/or as appropriate, an architectural historian who should make recommendations regarding the work necessary to determine importance. If the cultural resource is determined to be important under state or federal guidelines, impacts on the cultural resource will need to be mitigated.

MM-CUL10: Project sponsors can and should stop construction activities and excavation in the area where cultural resources are found until a qualified archaeologist can determine the importance of these resources.

Paleontological Resources

MM-CUL11: As part of the appropriate project/environmental review of individual projects, project sponsors can and should obtain a qualified paleontologist to identify and evaluate paleontological resources where potential impacts are considered high; the paleontologist should also conduct a field survey in these areas.

MM-CUL12: Project sponsors can and should ensure that construction activities avoid known paleontological resources, if feasible, especially if the resources in a particular lithic unit formation have been determined through detailed investigation to be unique.

MM-CUL13: Project sponsors can and should ensure that when a construction activity could significantly disturb soils or geologic formations in areas identified as having a moderate to high potential to support paleontological resources, a qualified researcher must be stationed on-site to observe during excavation operations and recover scientifically valuable specimens.

As part of this mitigation, the following actions should be taken:

- A certified paleontologist should be retained (or required to be retained) by the project sponsor prior to construction to establish procedures for surveillance and the preconstruction salvage of exposed resources if fossil-bearing sediments have the potential to be impacted.
- The paleontologist should provide preconstruction coordination with contractors, oversee original cutting in previously undisturbed areas of sensitive formations, halt or redirect construction activities as appropriate to allow recovery of newly discovered fossil remains, and oversee fossil salvage operations and reporting.
- This measure should be placed as a condition on all plans where excavation and earthmoving activity is proposed in a geologic unit having a moderate or high potential for containing fossils.
- Excavations of paleontological resources should be overseen by the qualified paleontologist and the paleontological resources given to a local agency, or other applicable institution, where they could be displayed or used for research.

MM-CUL14: Where practicable, project sponsors can and should avoid routes and project designs that would permanently alter unique features with archaeological and/or paleontological significance

Human Remains

MM-CUL15: As part of project oversight of individual projects, project sponsors can and should, in the event of discovery or recognition of any human remains during construction or excavation activities associated with the project, in any location other than a dedicated cemetery, should cease further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the coroner of the county in which the remains are discovered has been informed and has determined that no investigation of the cause of death is required.

MM-CUL16: If any discovered remains are of Native American origin:

- The coroner shall contact the Native American Heritage Commission in order to ascertain the proper descendants from the deceased individual. The coroner should make a recommendation to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods. This may include obtaining a qualified archaeologist or team of archaeologists to properly excavate the human remains. Or;
- If the Native American Heritage Commission is unable to identify a descendant, or the descendant failed to make a recommendation within 24 hours after being notified by the commission, the landowner or their authorized representative can and should obtain a Native American monitor, and an archaeologist, if recommended by the Native American monitor, and rebury the Native American human remains and any associated grave goods, with appropriate dignity, on the property and in a location that is not subject to further subsurface disturbance where the following conditions occur:
  - The Native American Heritage Commission is unable to identify a descendent;
  - The descendant identified fails to make a recommendation; or
  - The landowner or their authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

Cumulative Impacts

MM-CUL17: Impacts to cultural resources shall be minimized through cooperation, information sharing, and SCAG's ongoing regional planning efforts such as web-based planning tools for local government including CA Lots, and direct technical assistance efforts such as Compass Blueprint's Toolbox Tuesday series. Resource agencies, such as the Office of Historic Preservation, shall be consulted during this process.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Historical Resources

Implementation of Mitigation Measures **MM-CUL1** through **MM-CUL4** would reduce the potential impacts to historical resources. However, due to the regional scale of the Plan and potentially large number of historic resources that could be disturbed as a result of the 2012-2035 RTP/SCS transportation projects and development projects that would occur pursuant to the Plan, this impact remains significant.

Archaeological Resources

Implementation of Mitigation Measures **MM-CUL5** through **MM-CUL10** would reduce the potential impacts to archaeological resources. However, due to the regional scale of the Plan and potentially large

number of archaeological resources that could be disturbed as a result of the 2012-2035 RTP/SCS transportation projects and development projects that would occur pursuant to the Plan, this impact remains significant.

Paleontological Resources

Implementation of Mitigation Measures **MM-CUL11** through **MM-CUL14** would reduce the potential impacts to paleontological resources. However, due to the regional scale of the Plan and the large number of paleontological localities and unique geologic features found throughout the SCAG region that could be disturbed as a result of the 2012-2035 RTP/SCS transportation projects and development projects that would occur pursuant to the Plan, this impact remains significant

Human Remains

Implementation of Mitigation Measures **MM-CUL15** and **MM-CUL16** would reduce the potential impacts to human remains. However, the excavation and construction necessary for some projects in the 2012-2035 RTP/SCS has the potential to adversely disturb human remains on lands that are part of ancient Native American burial sites or sacred lands, therefore, this impact would remain significant.

Cumulative Impacts

Implementation of Mitigation Measures **MM-CUL1** through **MM-CUL17** would reduce potential cumulative impacts; however, the 2012-2035 RTP/SCS's accommodation of approximately 3.89 million people to the SCAG region by 2035 would contribute to cumulative impacts based on expanded urban development. Impacts to cultural resources from the 2012-2035 RTP/SCS would be cumulatively considerable.

COMPARISON WITH THE NO PROJECT ALTERNATIVE

Implementation of the 2012-2035 RTP/SCS would result in the same regional total population as the No Project Alternative. Population for both the No Project Alternative and the Plan is projected to be approximately 22.1 million people. However, no regional transportation investments would be made beyond the existing programmed projects under the No Project Alternative. The population distribution is assumed to follow past trends, uninfluenced by additional transportation investments and growth polices contained within the 2012-2035 RTP/SCS.

Direct Impacts

Under the No Project Alternative fewer areas would be impacted by excavation and construction activities related to transportation projects. However, the No Project Alternative would consume 742 square miles (474,900 acres) of undeveloped (vacant) land whereas the Plan would consume 334 square miles (213,800 acres) of undeveloped land. While the No Project Alternative would reduce the number of transportation projects built in the SCAG region, it would result in greater vacant land consumption that could, in turn, increase the chance to uncover a greater number of previously undisturbed resources. The Plan would result in concentration of development in previously developed urban areas, which could lead to greater impacts to historic buildings. However, many communities have in place regulations to protect historic resources, and even under the No Project Alternative these areas could still redevelop – although possibly not at the same intensity as under the plan. **On balance, it is anticipated that the 2012-2035 RTP/SCS's impacts to cultural resources would be less than the No Project Alternative because it would result in far less land disturbance.**

Cumulative Impacts

As discussed above, implementation of the 2012-2035 RTP/SCS would result in cumulative impacts to cultural resources throughout the State of California as historic resources are replaced with new development and land is disturbed thereby impacting archeological resources. The No Project Alternative would consume greater amounts of vacant land and result in a more spread out growth pattern that could result in the development of a greater amount of land that contains previously undisturbed and undiscovered archaeological, paleontological, or human remains. **Therefore, the No Project Alternative's cumulative impacts to cultural resources would be greater than those of the 2012-2035 RTP/SCS.**

3.5 GEOLOGY, SOILS AND MINERAL RESOURCES

This section describes the current geology, soils and mineral resources in the SCAG region, discusses the potential impacts of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategies (2012-2035 RTP/SCS or Plan) on geology, soils, and mineral resources, identifies mitigation measures for the impacts, and evaluates the residual impacts.

REGULATORY FRAMEWORK

Federal

Uniform Building Code (UBC). The UBC is published by the International Conference of Building Officials and forms the basis for California's building code, as well as approximately half of the state building codes in the United States. It has been adopted by the California Legislature to address the specific building conditions and structural requirements for California, as well as provide guidance on foundation design and structural engineering for different soil types. The UBC defines and ranks the regions of the United States according to their seismic hazard potential. There are four types of regions defined by Seismic Zones 1 through 4, with Zone 1 having the least seismic potential and Zone 4 having the highest.

United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). The NRCS maps soils and farmland uses to provide comprehensive information necessary for understanding, managing, conserving and sustaining the nation's limited soil resources. In addition to many other natural resource conservation programs, the NRCS manages the Farmland Protection Program, which provides funds to help purchase development rights to keep productive farmland in agricultural uses. Working through existing programs, USDA joins with State, tribal, and local governments to acquire conservation easements or other interests from landowners.

State

Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act). The Alquist-Priolo Act provides policies and criteria to assist cities, counties, and State agencies in the development of structures for human occupancy across the trace of active faults. The Alquist-Priolo Act was intended to provide the citizens of the State with increased safety and to minimize the loss of life during and immediately following earthquakes by facilitating seismic retrofitting to strengthen buildings, including historical buildings, against ground shaking.

Alquist-Priolo Special Study Zones. The Alquist-Priolo Act requires that special geologic studies be conducted to locate and assess any active fault traces in and around known active fault areas prior to development of structures for human occupancy. This State law was a direct result of the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. The Alquist-Priolo Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. This Act addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards.

California Building Code. The California Building Code is another name for the body of regulations contained in Title 24, Part 2, of the California Code of Regulations (CCR), which is a portion of the California Building Standards Code (CBSC, 1995). Title 24 is assigned to the California Building Standards Commission which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or they are not enforceable. Published by the International Conference of Building Officials, the UBC is a widely adopted model building code in the United States.

The California Building Code incorporates by reference the UBC with necessary California amendments. Approximately, one-third of the text within the California Building Code has been tailored for California earthquake conditions. Although widely accepted and implemented throughout the State, local, city and county jurisdictions can adopt the UBC either in whole or in part.

California Department of Transportation (Caltrans) Regulations. Caltrans' jurisdiction includes rights-of-way of state and interstate routes within California. Any work within the right-of-way of a federal or State transportation corridor is subject to Caltrans' regulations governing allowable actions and modifications to the right-of-way. Caltrans issues permits to encroach on land within their jurisdiction to ensure encroachment is compatible with the primary uses of the State Highway System, to ensure safety, and to protect the State's investment in the highway facility. The encroachment permit requirement applies to persons, corporations, cities, counties, utilities, and other government agencies. A permit is required for specific activities including opening or excavating a state highway for any purpose, constructing or maintaining road approaches or connections, grading within rights-of-way on any state highway, or planting or tampering with vegetation growing along any state highway. The encroachment permit application requirements relating to geology, seismicity and soils include information on road cuts, excavation size, engineering and grading cross-sections, hydraulic calculations, and mineral resources approved under Surface Mining Area Reclamation Act (SMARA).

Seismic Hazards Mapping Act. The Seismic Hazards Mapping Act of 1990 addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically-induced landslides. The purpose of the Act is to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and other hazards caused by earthquakes. The program and actions mandated by the Seismic Hazards Mapping Act closely resemble those of the Alquist-Priolo Act.

Southern California Catastrophic Earthquake Preparedness Plan. The Southern California Catastrophic Earthquake Preparedness Plan, adopted in 2008, examines the initial impacts, inventories resources, cares for those wounded and homeless and develops a long-term recovery process. The process of Long-Term Regional Recovery (LTRR) provides a mechanism for coordinating Federal support to State, tribal, regional, and local governments, nongovernmental organizations (NGOs), and the private sector to enable recovery from long-term consequences of extraordinary disasters. The LTRR process accomplishes this by identifying and facilitating the availability and use of recovery funding sources, and providing technical assistance (such as impact analysis) for recovery and recovery planning support. "Long term" refers to the need to re-establish a healthy, functioning region that will sustain itself over time. Long-term recovery is not debris removal and restoration of utilities, which are considered immediate or short-term recovery actions. The LTRR's three main focus areas are housing, infrastructure (including transportation), and economic development.

Local

General Plans and Seismic Safety Element. City and county governments typically develop as part of their General Plans, safety and seismic elements that identify goals, objectives, and implementing actions to minimize the loss of life, property damage and disruption of goods and services from man-made and natural disasters including floods, fires, non-seismic geologic hazards and earthquakes. Local governments may provide policies and develop ordinances to ensure acceptable protection of people and structures from risks associated with these hazards. Ordinances may include those addressing unreinforced masonry construction, erosion or grading.

EXISTING SETTING

Topographic and Geologic Structures

The SCAG region extends primarily over four[1] California geomorphic provinces, the Mojave Desert, the Transverse Ranges, the Peninsular Ranges, and the Colorado Desert.[2] These provinces are naturally defined geologic regions that display a distinct landscape or landform, shown in **Map 3.5-1** which is located in the map chapter at the end of this document.

Mojave Desert. The Mojave Desert geomorphic province occupies approximately 25,000 square miles. It is a broad interior region of isolated mountain ranges separated by expanses of desert. There are two important fault trends that control topography a prominent northwest-southeast trend and a secondary east-west trend. The Mojave province is wedged in a sharp angle between the Garlock Fault to the north (southern boundary Sierra Nevada) and the San Andreas Fault to the west (where it bends east from its northwest trend). The Nevada state line defines its eastern boundary and the San Bernardino/Riverside county line defines its southern boundary. Portions of Los Angeles and San Bernardino Counties lie within this province.

Erosional features such as broad alluvial basins that receive non-marine sediments from the adjacent uplands dominate the Mojave Desert region. Numerous playas, or ephemeral lakebeds within internal drainage basins, also characterize the region. Throughout this province, small hills - some the remnants of ancient mountainous topography - rise above the valleys that are surrounded by younger alluvial sediments. The highest elevation approaches 4,000 feet above sea level (asl), and most valleys lie between 2,000 to 4,000 feet asl.

Transverse Ranges. The Transverse Ranges are an east-west trending series of steep mountain ranges and broad alluvial valleys that extend approximately 320 miles from Point Arguello in the west to the Little San Bernardino Mountains in the east. The east-west structure of the Transverse Ranges is oblique to the normal northwest trend of coastal California, hence the name "Transverse." This geomorphic province includes Ventura County and portions of Los Angeles, San Bernardino, and Riverside Counties. It also extends offshore to include San Miguel, Santa Rosa, and Santa Cruz islands.

There is intense north-south compression squeezing the Transverse Ranges and resulting in the prominent basins and ranges found in this province, including the Ventura basin and the San Gabriel and San Bernardino Mountains. This is one of the most rapidly rising regions on earth. Several active faults, such as the San Andreas Fault Zone, are located in the Transverse Ranges. Other faults in the province include the Santa Clara River Valley fault, the San Gabriel Fault Zone, the Santa Cruz Island faults, the Santa Rosa Island Faults and the Soledad faults. This province is one of the most geologically diverse in California, containing a wide variety of bedrock types and structures. California's highest peaks south of the central Sierra Nevada and the only Paleozoic rocks in the coastal mountains in the United States are found here. Because of the great lithologic diversity, the province is further subdivided into eight subprovinces, each displaying its own geologic signature. Broad alleviated valleys, narrow stream canyons, and prominent faults separate these subprovinces.

Peninsular Ranges. The Peninsular Ranges province consists of a series of ranges separated by northwest trending valleys, subparallel to faults branching from the San Andreas Fault. This province is bounded on the northwest by the Transverse Ranges, on the east by the Colorado Desert, and extends south, encompassing the Los Angeles Basin and terminating 775 miles south of the United States-Mexico border. The Peninsular Ranges include the southern portion of Los Angeles County, the southwest corner of San Bernardino County, all of Orange County and the San Jacinto Mountains and the Coachella Valley in the

[1]Except a small sliver of the northwest corner of San Bernardino County is located in the Basin and Range province
[2]California Geological Survey. 2002. California Geomorphic Provinces.

central portion of Riverside County. The ranges are comprised of a series of northwest-southeast trending mountains that are separated by several active faults, including the San Jacinto and Elsinore Fault zones.

The Peninsular Ranges is one of the largest geologic units in western North America. Its highest elevations are found in the San Jacinto-Santa Rosa Mountains, with San Jacinto Peak reaching 10,805 feet asl. The orientation and shape of the Peninsular Ranges is similar to the Sierra Nevada, in that the west slope is gradual and the eastern face is steep and abrupt. Drainage from the province is typically by the San Diego, San Dieguito, San Luis Rey and Santa Margarita rivers**.**

Colorado Desert (Salton Trough). The Colorado Desert geomorphic province (also referred to as the Salton Trough) is a depressed block between active branches of alluvium-covered San Andreas Fault with the southern extension of the Mojave Desert province in the east. Its roughly triangular shape is bounded to the east by the Chocolate Mountains, to the west by the Peninsular Ranges and extends south into Mexico. The area is a low-lying, barren desert basin dominated by the Salton Sea. This province includes a large portion of Imperial County and a small portion of central Riverside County. The Colorado Desert is divided into two main valleys, the deep Imperial Valley to the south and the narrower and shallower Coachella Valley to the north. A good portion of both valleys lie below sea level with the lowest elevation found in the Salton Basin at 235 feet below sea level. The area is characterized by the ancient beach lines and silt deposits of extinct Lake Cahuilla. Geologic features include playas separated by sand dunes and the occurrence of seismic and a seismic subsidence due to the San Andreas Fault system.

Soils and Geologic Materials

Soils within the SCAG region are classified by distinguishing characteristics and are arranged within soil associations.[3] Soils throughout the region differ in origin, composition, and slope development. Individual soil characteristics are important in determining the suitability of the soil for agricultural use or for urbanized development. The formation of surficial soil depends on the topography, climate, biology, local vegetation, and the material on which the soil profile is developed. Although many soils in the SCAG region are suitable for agricultural uses, each soil type may have properties that could limit its uses and represent an agricultural or development hazard.[4] These limitations are listed and discussed below. **Map 3.5-2**, which is located in the map chapter at the end of this document, shows the general location of soil types contained within the SCAG region. Applicable USDA NRCS soil surveys for specific counties provide the classification and description of each soil type encountered in the SCAG region. **Map 3.8-11** contains the general location of areas considered prime or important farmlands.

Soil Erosion. Soil erosion is also a natural on-going process that transports, erodes and displaces soil particles through a transport mechanism such as flowing water or wind. Erosion is the physical detachment and movement of soil materials through natural processes or human activities. Three soil factors are strongly associated with soil erosion potential: texture, compactness and structure. Of these, texture plays the most dominant role. Intermediate textured soil types tend to be most erodible, whereas clay and particles coarser than sand are more resistant to erosion. Slopes influence the rate and amount of runoff, and in turn these influence erosion. Loose texture and steep slopes primarily result in high wind erosibility potential in soils. Wind erosion is most severe in arid regions where sandy or loamy sediments are unvegetated and exposed to severe wind conditions, such as the eastern portions of San Bernardino, Riverside, and Imperial Counties.

Human intervention can accelerate the natural erosion process. For instance, typical consequences of development increase erosion potential due to the removal of vegetative cover and reduction of overall permeable area. These activities can lead to increased water runoff rates and concentrated flows that have greater potential to erode exposed soils. The effects of excessive erosion range from nuisance problems that

[3]Soil Association – A mapping unit consisting of a group of defined and taxonomic soil units occurring together in an individual and characteristic pattern over a geographic region.

[4]USDA, Soil Conservation Service. 1970. *Soil survey of Ventura area, California,* issued April, 1970

require additional maintenance, such as increased siltation in storm drains, to instances of more severe damage where water courses are down-cut and gullies develop. These processes can eventually undermine adjacent structures or topography. Human activities that disturb soils in arid regions also increase wind erosion potential. Many of the desert areas in the SCAG region are susceptible to blowing sand, a severe form of wind erosion that damages property and accumulates soil on roadways. The majority of the soils in the SCAG region exhibit moderate to high erosion potential, which can be compounded by development. **Map 3.5-3** shows the general location of soils within the SCAG region that exhibit moderate to high erosion potential.

Coastal Erosion. Coastal erosion is a natural process that is typically the most visible during storm events. Beach sand is replenished by sediment loads in rivers and gentler waves after storm events or during summer months. Erosion rates of one inch per year are considered moderate. However, depending on the severity and duration of storm events and the degree of human intervention with natural coastline or riverine processes, coastal erosion can proceed at considerable rates, resulting in rapid visible coastline recession. In areas of extreme coastal erosion, such as the cities of Rancho Palos Verdes and Malibu, slopes have been undercut by waves during storm events, causing slope failure and resulting in property damage and risks to human health and safety. The coastal regions of Los Angeles, Orange, and Ventura Counties are susceptible to wave erosion hazards.

The Pacific Ocean borders the Peninsular Range province and the Transverse Range Province on the west. Nearly all the sea cliffs along the coast display some sign of coastal erosion. Coastal retreat is attributable to various processes, including undercutting from wave action, weathering and erosion of rocks and cliffs, emergence of groundwater at the cliff face, rain-wash, and landsliding. Additionally, these naturally occurring forces can be assisted by human activity such as coastal road construction, channelization of surface water flows, or development on marine terraces.

Expansive Soils. Expansive soils possess a "shrink-swell" behavior. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Structural damage may result over a long period of time, usually the result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Typically, soils that exhibit expansive characteristics comprise the upper five feet of the surface. The effects of expansive soils could damage foundations of aboveground structures, paved roads and streets, and concrete slabs. Expansion and contraction of soils, depending on the season and the amount of surface water infiltration, could exert enough pressure on structures to result in cracking, settlement, and uplift. Locations of expansive soils are site-specific and can generally be remedied through standard engineering practices.

Seismicity

The SCAG region is located in an area that has historically experienced high seismicity. In the past 100 years, several earthquakes of magnitude 5.0 or larger have been reported on the active San Andreas, San Jacinto, Elsinore, and Newport-Inglewood fault systems, all of which traverse the SCAG region. As a result, significant earthquake hazards exist in the region.[5] Injury to people and damage to structures during earthquakes can be caused by actual surface rupture along an active fault, by ground shaking from a nearby or distant fault, liquefaction, or dam failure. In Southern California, the last earthquake exceeding Richter magnitude 8.0 occurred in 1857. Much more frequent are smaller temblors, like the relatively moderate (but

[5]It should be noted that new faults continue to reveal themselves, such as in the case of the Northridge earthquake of 1994, and the potential seismic threats posed by these faults also continue to be reevaluated on the basis of new geologic information and analysis, as in the recent case of the Puente Hills Fault [Dolan et al., 2003; McFarling, 2003].

still exceedingly damaging) 1971 San Fernando and 1994 Northridge earthquakes, both classified as magnitude 6.7 earthquakes.[6]

Faults. A fault is a fracture in the crust of the earth along which there has been displacement of the sides relative to one another parallel to the fracture. Most faults are the result of repeated displacements over a long period of time. Numerous active and potentially active faults have been mapped in the region. The SCAG region contains lateral strike slip faults similar to the San Andreas and various identified and hidden blind thrust faults. A fault trace is the surface expression of a particular fault. Buried or blind thrust faults are thought to underlie much of the SCAG region. These "buried" faults do not exhibit readily identifiable traces on the earth's surface and are typically at considerable depth within the underlying geologic formation. Although these faults typically do not offset surface deposits, they can generate substantial ground shaking.

The California Geological Survey (CGS) defines active faults as those that have exhibited evidence of displacement during Holocene (10,000 years ago to present) period. Potentially active faults are defined as faults that have exhibited evidence of displacement during the Pleistocene period (10,000 years to 1.8 million years ago). Class A faults have slip rates greater than 5 millimeters per year (mm/yr) and generally have substantial historic seismic data available, while Class B faults have slip rates smaller than 5 mm/yr and, as a rule, historic seismic data on which to develop reliable recurrence intervals of large events is lacking.

Table 3.5-1 characterizes the major faults in the SCAG region. **Map 3.5-4** illustrates the geographic location of these faults, as well as potential areas of probabilistic ground acceleration, which is discussed in further detail under the Ground Shaking subheading, below.

TABLE 3.5-1: CHARACTERISTICS OF MAJOR FAULTS IN THE SCAG REGION

Counties		Recency /a/	Slip-Rate (m/m/yr)	Max, Moment /b/
Los Angeles, San Bernardino, Riverside, Imperial		Historic	25.0-34.0	7.2-7.5
San Bernardino, Riverside, Imperial		Holocene, Later Quaternary	4.0-20.0	6.6-7.2
Riverside, Imperial		Holocene	2.5-5.0	6.8-7.1
CLASS B FAULTS				
Fault	**Counties**	**Recency**	**Slip Rate (mm/yr)**	**Max. Moment**
ELSINORE AND SAN JACINTO FAULT ZONES (NON A FAULTS)				
Brawley Seismic Zone	Imperial		25.0	6.4
Chino	San Bernardino, Riverside		1.0	6.7
Earthquake Valley	-		2.0	6.5
Elmore Ranch	Imperial		1.0	6.6
GARLOCK FAULT ZONES				
Garlock-west	San Bernardino		6.0	7.3
Garlock-east	San Bernardino		7.0	7.5
Owl Lake	San Bernardino		2.0	6.5

[6]The human and economic damage caused by earthquakes tends to increase with time, as more and more people and property come to occupy more and more of the land, thus cumulatively increasing the exposure of human habitation to seismic hazard. The 1994 Northridge earthquake, though hardly the most severe experienced by Southern California, was deemed the most expensive, in terms of its economic cost and its damage to human property. The California Office of Emergency Services claimed a $15 billion total damage estimate [EQE International, 1994].

TABLE 3.5-1: CHARACTERISTICS OF MAJOR FAULTS IN THE SCAG REGION

Fault	Counties	Recency	Slip Rate (mm/yr)	Max. Moment
TRANSVERSE –RANGES AND LOS ANGELES BASIN				
Clamshell-Sawpit	Los Angeles		0.5	6.5
Cucamonga	San Bernardino		5.0	6.9
Hollywood	Los Angeles		1.0	6.4
Holser	Ventura		0.4	6.5
Malibu Coast	Los Angeles, Ventura		0.3	6.7
Mission Ridge - Arroyo Parida - Santa Ana	Los Angeles		0.4	7.2
Newport-Inglewood	Los Angeles, Orange	Late Quaternary (?)	1.0	7.1
Oak Ridge	Ventura	Holocene, Late Quaternary	4.0	7.0
Palos Verdes	Los Angeles		3.0	7.3
Pleito	-		2.0	7.0
Raymond	Los Angeles		1.5	6.5
Red Mountain	San Bernardino		2.0	7.0
San Cayetano	Ventura		6.0	7.0
San Gabriel	Ventura, Los Angeles	Holocene	1.0	7.2
San Jose	San Bernardino, Los Angeles		0.5	6.4
Santa Monica	Los Angeles		1.0	6.6
Santa Ynez (West)	Ventura		2.0	7.1
Santa Ynez (East)	Ventura		2.0	7.1
Santa Susana	Ventura, Los Angeles	Historic, Late Quaternary	5.0	6.7
Sierra Madre (San Fernando)	Los Angeles		2.0	6.7
Sierra Madre	Los Angeles	Holocene, Late Quaternary	2.0	7.2
Simi-Santa Rosa	Ventura		1.0	7.0
Ventura-Pitas Point	Ventura		1.0	6.9
Verdugo	Los Angeles, Ventura		0.5	6.9
White Wolf	-		2.0	7.3
LOS ANGELES BLIND THRUSTS				
Upper Elysian Park	-		1.3	6.4
Northridge	Ventura, Los Angeles		1.5	7.0
Puente Hills blind thrust	Los Angeles		0.7	7.1
San Joaquin Hills	Orange		0.5	6.6

TABLE 3.5-1: CHARACTERISTICS OF MAJOR FAULTS IN THE SCAG REGION

Fault	Counties	Recency	Slip Rate (mm/yr)	Max. Moment
TRANSVERSE- RANGES AND MOJAVE				
Blackwater	-		0.6	7.1
Burnt Mountain	-		0.6	6.5
Calico-Hidalgo	San Bernardino		0.6	7.3
Cleghorn	San Bernardino		3.0	6.5
Eureka Peak	-		0.6	6.4
Gravel Hills - Harper Lake	San Bernardino		0.6	7.1
Helendale - S. Lockhart	San Bernardino		0.6	7.3
Johnson Valley (Northern)	San Bernardino		0.6	6.7
Landers	-		0.6	7.3
Lenwood - Lockhart-Old Woman Springs	San Bernardino		0.6	7.5
North Frontal Fault zone (Western)	San Bernardino		1.0	7.2
North Frontal Fault zone (Eastern)	San Bernardino		0.5	6.7
Pinto Mountain	San Bernardino		2.5	7.2
Pisgah - Bullion Mountain-Mesquite Lake	San Bernardino		0.6	7.3
S. Emerson - Copper Mountain	San Bernardino		0.6	7.0

/a/ "Recency of fault movement refers to the time period when the fault is believed to have last moved. The age is expressed in terms of the Geologic Time Scale. Generally, the older the activity on a fault, the less likely it is that the fault will produce an earthquake in the near future. For assessing earthquake hazard, usually only faults active in the Late Quaternary or more recently are considered. These include the following three non-overlapping time periods: Historic: Refers to the period for which written records are available (approximately the past 200 years, in California and Nevada).
Holocene: Refers to a period of time between the present and 10,000 years before present. Faults of this age are commonly considered active. For the purpose of classifying faults, C.W. Jennings defined Holocene to exclude the Historic; that is, from 200 to 10,000 years before the present).
Late Quaternary: Refers to the time period between the present and approximately 700,000 years before the present. Here too, for the purpose of classifying faults, Jennings defined Late Quaternary to exclude the Holocene and the Historic website, http://quake.wr.usgs.gov/info/faultmaps/slipage.html, accessed July 27, 2011.
Where no recency data is given, no determination has been made.
/b/ The Maximum Moment Magnitude is an estimate of the size of a characteristic earthquake capable of occurring on a particular fault. Moment magnitude is related to the physical size of a fault rupture and movement across a fault. Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event [CGS, 2002b]. Richter magnitude estimations can be generally higher than moment magnitude estimations.
SOURCE: Southern California Probabilistic Seismic Hazard Assessment Maps (PSHA) website, *http://www.conservation.ca.gov/cgs/rghm/psha/ofr9608/Pages/Index.aspx*, accessed July 27, 2011; U.S. Geology Survey website, *http://quake.wr.usgs.gov/recenteqs/FaultMaps/118-34.htm*, accessed, July 27, 2011; Petersen, M.D., Bryant, W.A., and Cramer, C.H. Probabilistic seismic hazard assessment for the State of California, California Department of Conservation, Division of Mines, 1996; Geology Open-File Report issued jointly with U.S. Geology Survey, CDMG 96-08 and U.S. Geology Survey 96-706 website, *http://www.conservation.ca.gov/cgs/rghm/psha/ofr9608/Pages/Index.aspx*, accessed July 27, 2011.

Seismic Hazards. Movements on the previously identified faults will likely cause future earthquakes in the SCAG region. Earthquakes can originate in areas where potential seismic energy has built up along a fault over time, but has not yet been released in the form of an earthquake. Studies supported by the National Earthquake Hazards Reduction Program enable scientists to evaluate the hazard level in different areas. In Southern California, scientists estimate that the probability of a magnitude 7.0 or greater earthquake by the year 2024 approaches 80 to 90 percent.

The four major hazards generally associated with earthquakes are ground shaking, surface fault rupture (ground displacement), liquefaction ground failures, and settlement. A detailed discussion of these types of hazards is found below.

Ground Shaking. Ground shaking may affect areas hundreds of miles distant from the earthquake's epicenter. Historic earthquakes have caused strong ground shaking and damage in many areas of the SCAG

region. The composition of underlying soils in areas located relatively distant from faults can intensify ground shaking. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill.

Ground shaking is commonly described in terms of peak ground acceleration as a fraction of the acceleration of gravity (g), or by using the Modified Mercalli (MM) Intensity Scale, a common metric for characterizing intensity. The MM Intensity Scale is a more descriptive method involving 12 levels of intensity denoted by Roman numerals. As presented in **Table 3.5-2**, MM intensities range from level I (shaking that is not felt) to level XII (total damage). MM intensities ranging from IV to X could cause moderate to significant structural damage. The degree of structural damage, however, will not be uniform. Not all buildings perform identically in an earthquake. The age, material, type, method of construction, size, and shape of a building all affect its performance.

TABLE 3.5-2: MODIFIED MERCALLI INTENSITY SCALE

I.	Not felt except by a very few under especially favorable conditions.
II.	Felt only by a few persons at rest, especially on upper floors of buildings.
III.	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV.	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V.	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI.	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII.	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII.	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX.	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X.	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI.	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII.	Damage total. Lines of sight and level are distorted. Objects thrown into the air.
XIII.	Not felt except by a very few under especially favorable conditions.

SOURCE: U.S. Geology Survey, National Earthquake Information Center website, *http://neic.usgs.gov/neis/general/mercalli.html*, accessed July 27, 2011.

Earthquakes on the various and potentially active fault systems are expected to produce a wide range of ground shaking intensities in the SCAG region. The estimated maximum moment magnitudes represent characteristic earthquakes on particular faults.[7] While the magnitude is a measure of the energy released in an earthquake, intensity is a measure of the ground shaking effects at a particular location. Shaking intensity can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and characteristics of geologic media. Generally, intensities are highest at the fault and decrease with distance from the fault. As discussed above, potential areas of Probabilistic Ground Acceleration are shown in **Map 3.5-4** in the map chapter.

[7]Moment magnitude is related to the physical size of a fault rupture and movement across a fault. Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event [California Geological Survey (CGS), 1997]. See Table 4.6-1, pg. 4.6-5, for the moment magnitudes associated with particular faults

Surface Fault Rupture. The surface expression of earthquake fault rupture typically occurs in the immediate vicinity of the originating fault. The magnitude and nature of the rupture may vary across different faults, or even along different segments of the same fault.[8] Rupture of the surface during earthquake events is generally limited to the narrow strip of land immediately adjacent to the fault on which the event is occurring. Surface ruptures associated with the 1992 Landers earthquake in San Bernardino County extended for a length of 50 miles, with displacements varying from one inch to 20 feet.

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972, to mitigate the risk to human habitation of seismically-induced ground-surface ruptures. This state law was a direct result of the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. Surface rupture is the most easily avoided seismic hazard, provided regulatory stipulations embedded in this law are met.

The law requires the State Geologist to establish regulatory zones (known as Earthquake Fault Zones) around the surface traces of active faults, and to issue appropriate maps.[9] An indicative map of identified Earthquake Fault Zones delineating potential rupture areas is provided in **Map 3.5-4**. Detailed maps are distributed to all affected cities, counties, and state agencies for their use in planning new or renewed construction. Local agencies must regulate most development projects within the zones, including all land divisions and most structures intended for human habitation. Fault surface rupture almost always follows preexisting faults, which are zones of weakness. Rupture may occur suddenly during an earthquake, or slowly in the form of fault creep. Sudden displacements are more damaging to structures because they are accompanied by ground shaking. Fault creep is the slow rupture of the earth's crust. Not all earthquakes result in surface rupture (e.g., the 1994 Northridge earthquake).

Liquefaction and Ground Failure. Liquefaction is the process by which water-saturated sandy soil materials lose strength and become susceptible to failure during strong ground shaking in an earthquake. The shaking causes the pore-water pressure in the soil to increase, thus transforming the soil from a stable solid to a more liquid form. Liquefaction has been responsible for ground failures during almost all of California's large earthquakes. The depth to groundwater can control the potential for liquefaction; the shallower the groundwater, the higher the potential for liquefaction. Earthquake-induced liquefaction most often occurs in low-lying areas with soils or sediments composed of unconsolidated, saturated, clay-free sands and silts, but can also occur in dry, granular soils, or saturated soils with some clay content.

Four kinds of ground failure commonly result from liquefaction: lateral spread, flow failure, ground oscillation, and loss of bearing strength. A *lateral spread* is a horizontal displacement of surficial blocks of sediments resulting from liquefaction in a subsurface layer. Lateral spread occurs on slopes ranging between 0.3 and 3 percent and commonly displaces the surface by several meters to tens of meters. *Flow failures* occur on slopes greater than 3 degrees and are primarily liquefied soil or blocks of intact material riding on a liquefied subsurface zone. *Ground oscillation* occurs on gentle slopes when liquefaction occurs at depth and no lateral displacement takes place. Soil units that are not liquefied may pull apart from each other and oscillate on the liquefied zone. Ground fissures can accompany ground oscillation and sand boils and damage underground structures and utilities. The *loss of bearing pressure* can occur beneath a structure when the underlying soil loses strength and liquefies. When this occurs, the structure can settle, tip, or even become buoyant and "float" upwards.

Liquefaction potential is a function of the potential level of ground shaking at a given location and depends on the geologic material at that location. Structural failure often occurs as sediments liquefy and cannot support structures that are built on them. Alluvial valleys and coastal regions are particularly susceptible to liquefaction. Unconsolidated alluvial deposits in desert region deposits are rarely saturated because of the

[8]California Geological Survey (CGS), *Guidelines for evaluating the hazard of surface fault rupture*, CGS Note 49, 2002a.
[9]"Earthquake Fault Zones" were called "Special Studies Zones" prior to January 1, 1994.

depth to the water table and are thus less susceptible to liquefaction than unconsolidated alluvium adjacent to stream channels. **Map 3.5-5** identifies liquefaction potential of areas in the SCAG region.

Earthquake-Induced Subsidence. Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid compaction and settling of subsurface materials (particularly loose, non-compacted, and variable sandy sediments) due to the rearrangement of soil particles during prolonged ground shaking. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Within the SCAG region, artificial fills, unconsolidated alluvial sediments, slope washes, and areas with improperly engineered construction-fills typically underlie areas susceptible to this type of settlement.

Seismically-Induced Landslides. Strong ground shaking during earthquake events can generate landslides and slumps in uplands or coastal regions near the causative fault. Seismically-induced landsliding has typically been found to occur within 75 miles of the epicenter of a magnitude 6.5 earthquake.

Seismically-induced landslides would be most likely to occur in areas that have previously experienced landslides or slumps, in areas of steep slopes, or in saturated hillside areas. Areas of the SCAG region are susceptible to seismically-induced landsliding because of the abundance of active faults in the region and the existing landslide hazards. Areas of potential landslides in the SCAG region are shown in **Map 3.5-6**.

Earthquake-Induced Inundation. Because California and the West Coast of the United States are seismically active, California is subject to flood hazard from tectonic activity capable of generating submarine earthquakes, volcanic eruptions, and landslides. Considering its proximity to the Pacific Ocean, the inundation by tsunamis (seismic sea waves) or seiches (oscillating waves in enclosed water bodies) can occur along the California coast in the event of significant earthquake. For purposes of a relative comparison, an earthquake with its epicenter in Alaska and with a magnitude of 8.5 (Richter scale) generated a seismically induced sea wave with a maximum wave height of 11 feet in the Monterey Harbor, on the central coast of California north of the SCAG region.

Tsunami. Tsunamis are ocean waves caused by large earthquakes and landslides that occur near or under the ocean. Tsunami waves are unlike typical ocean waves generated by wind and storms. When tsunamis approach shore, they behave like a very fast moving tide that extends far inland. Considering California's proximity to the Pacific Ocean, the inundation by tsunamis can occur along the California coast in the event of a significant earthquake. Relatively local earthquakes and landslides off the California coast pose the greatest threat.[10] **Map 3.5-7** shows areas within the SCAG region susceptible to Tsunamis.

Geologic Hazards

Geologic hazards are natural geologic events that can endanger human lives and threaten human property. Potential geologic hazards include settlement, subsidence, and landslides. Relevant geologic hazards applicable to the SCAG region are discussed below. These conditions are important with respect to transportation, as they may pose hazards that can affect operation of facilities or can constrain system development.

Settlement. Loose, soft soil material comprised of sand, silt and clay, if not properly engineered, has the potential to settle after a building is placed on the surface. Settlement of the loose soils generally occurs slowly but over time can amount to more than most structures can tolerate. Building settlement could lead to structural damage such as cracked foundations and misaligned or cracked walls and windows. Settlement problems are site-specific and can generally be remedied through standard engineering applications

Land Subsidence. Land subsidence is caused by a variety of agricultural, municipal or mining practices that contribute to the loss of support materials within a geologic formation. Agricultural practices can cause

[10] U.S. Geology Survey website, *http://earthquake.usgs.gov/research/structure/crust/cascadia.php*, accessed July 27, 2011.

oxidation and subsequent compaction and settlement of organic clay soils or hydro-compaction allowing land elevations to lower or sink. Agricultural and municipal practices can result in the overdraft of a groundwater aquifer thereby causing aquifer settlement. Groundwater overdraft occurs when groundwater pumping from a subsurface water-bearing zone (aquifer) exceeds the rate of aquifer replenishment. The extraction of mineral or oil resources can also result in subsidence from removal of supporting layers in the geologic formation. Substantial subsidence occurs in the SCAG region due to groundwater extraction and subsequent lowering of the groundwater surface, typically beneath a confining clay stratum. The impact of subsidence could include lowering of the land surfaces, increased potential for flooding, potential disturbance or damage to buried pipelines and associated structures, and damage to structures designed with minimal tolerance for settlement.

Landslides. Landslides refer to the rapid downslope movement of a mass of material that moves as a unit and carries with it all the loose material above bedrock. Landslides occur more frequently on steep slopes or after periods of heavy rain due to the additional weight of water and its lubricating qualities. The material in the slope and external processes such as climate, topography, slope geometry, and human activity can render a slope unstable and eventually initiate slope movements and failures. Changes in slope material such as improperly engineered fill slopes can alter water movement and lead to chemical and physical changes within the slope. Unfavorable fracture or joint orientation and density may develop as a rock material responds to reduced weight or strain relief, resulting in a decreased ability of the rock material to resist movement. Removing the lower portion (the toe) decreases or eliminates the support that opposes lateral motion in a slope. This can occur by man-made activity such as excavations for road-cuts located along a hillside. Over-steepening a slope by removing material can also reduce its lateral support. Placement of buildings on slopes can increase the amount of stress that is applied to a potential failure surface. Shaking during an earthquake may lead materials in a slope to lose some cohesion, cause liquefaction or change pore water pressures. Landslide-susceptible areas within the SCAG region are those with low-strength soil material on hilly topography, for example, the Portuguese Bend and Point Fermin areas of the Palos Verdes Peninsula, and the Blackhawk slide area on the north slope of the San Bernardino Mountains. Factors that decrease resistance to movement in a slope include pore-water pressure, material changes, and structure. As discussed above, **Map 3.5-6** shows areas within the SCAG region susceptible to landslides.

Mineral Resources

Mineral resource extraction occurs in various portions of California, but is generally limited to non-urban areas. **Map 3.5-8** shows aggregate availability in the SCAG region. **Map 3.5-9** shows mineral resource zones in the SCAG region. Definitions of mineral resource zones are as follows:

- MRZ-1Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that there is little likelihood for their presence.
- MRZ-2: Areas where adequate information indicates that significant mineral deposits are present or where it is judged that there is a high likelihood for their presence.
- MRZ-3: Areas containing mineral deposits, the significance of which cannot be evaluated from available data.

Each county's general plan is required to identify significant mineral resource areas and apply appropriate land use designations to ensure their future availability. Most of the comprehensive mineral resource mapping in California has been completed for urban areas where there is a high probability that converted land uses would be incompatible with mining. Gold, sand, and gravel are the primary mineral resources still extracted throughout the SCAG region.

Construction aggregate refers to sand and gravel (natural aggregates) and crushed stone (rock) that are uses as Portland-cement-concrete aggregate, asphaltic-concrete aggregate, road base, railroad ballast, riprap, and fill for the production of other construction materials. According to the CGS, the State currently has

approximately 4.3 billion tons of permitted resources and the CGS estimates the State will need approximately 13.5 billion tons of aggregate in the next 50 years.[11] California's construction industry is greatly dependent on readily available aggregate deposits that are within a reasonable distance to market regions. Aggregate is a low unit-value, high bulk-weight commodity; therefore, aggregate for construction must be obtained from nearby sources in order to minimize costs to the consumer. If nearby aggregate sources do not exist, then transportation costs can quickly exceed the value of the aggregate.

The Department of Conservation, CGS prepares information regarding aggregate resources in the State. The most recent report (2006) indicates the following information with respect to permitted aggregate resources and 50-year demand in the SCAG region. The 50-year demand is based on a per capita consumption forecast, developed from historic data, as shown in **Table 3.5-3** below. This method has been shown to be reasonably accurate in forecasting demand; it tends to smooth out spikes in demand that occur as a result of large-scale projects in a particular area. (It should be noted that although there are aggregate mines in Imperial County, the Geological Survey does not provide permit and demand data for Imperial County.)

TABLE 3.5-3: PERMITTED AGGREGATE RESOURCES AND 50 YEAR DEMAND IN THE SCAG REGION (MILLION TONS)

Aggregate Study Area	Permitted Resources	50 Year Demand as of Jan. 2006
Palm Springs	176	295
San Bernardino	262	1,074
Barstow-Victorville	133	179
Temescal Valley – Orange County	355	1,122
San Gabriel Valley	370	1,148
San Fernando Valley – Saugus Newhall	88	457
Palmdale	181	665
Claremont - Upland	147	300
Ventura County	106	309
Total	**1,818**	**5,549**

SOURCE: Department of Conservation, Aggregate Availability in California, 2006.

Table 3.5-3 shows that just under one third of the projected 50-year demand is currently permitted in the SCAG region (not counting mines in Imperial County). The Geological Survey estimates that there are up to 74 billion tons of non-permitted resources State-wide. Non-permitted aggregate resources are deposits that may meet specifications for construction aggregate, are recoverable with existing technology, have no land overlying them that is incompatible with mining, and currently, are not permitted for mining. Resource areas include areas that that are known to contain aggregate resources and have compatible land uses such as agricultural land, open space lands (not designated as parks), and forest lands. Uses that are considered incompatible with mining include urban areas, county and state parks, national parks and golf courses. **Table 3.5-4** below shows the estimated non-permitted resources in the region.

While the estimated amount of non-permitted resources is large, it is unlikely that all of these resources will ever be mined because of social, environmental, or economic factors. Aggregate resources located too close to urban or environmentally sensitive areas can limit or stop their development. These resources may also be located too far from a potential market to be economically viable. In spite of such possible constraints, non-permitted aggregate resources are the most likely future sources of construction aggregate potentially available to meet California's continuing demand.

[11] Department of Conservation, Natural Resources Agency, State Mining and Geology Board Annual Report 2009-2010, *http://www.conservation.ca.gov/smgb/reports/Annual%20Reports/Documents/SMGB%2009-10%20AR%20Final%20Draft%20(041311).pdf*, accessed August 2011.

TABLE 3.5-4: ESTIMATED NON-PERMITTED AGGREGATE RESOURCES IN THE SCAG REGION (MILLION TONS)

County	Million Tons
Orange and Riverside	1,390
Los Angeles	15,258
San Bernardino	15,000
Imperial	N/A
Ventura	5,990

SOURCE: Susan Kohler, Department of Conservation, Personal Communication 2009.

THRESHOLDS OF SIGNIFICANCE

The 2012-2035 RTP/SCS would have a significant impact related to geology, soil, seismicity, and mineral soils if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death, involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issues by the State Geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction;
  - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Locate projects on a geologic unit 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;
- Located projects on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property; and/or
- Result in the loss of availability of known aggregate and mineral resources that would be of value to the region and residents of the State.
- Result in a cumulatively considerable adverse effect on human beings and property when considered at the regional scale.

Methodology

The following outlines the methodology used to evaluate the expected impacts of implementation of the 2012-2035 RTP/SCS on geology, soils, seismicity and mineral resources in the SCAG region. The 2012-2035 RTP/SCS's transportation projects and growth projections for the year 2035 are regional, cumulative, and long-term in nature, and provide a conservative estimate of potential environmental impacts.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all

transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of geology, soils, seismicity, and mineral resources includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan were adopted (No Project). This evaluation is not included in the determination of the significance of impacts (which is based on a comparison to existing conditions); however, it provides a meaningful perspective on the effects of the 2012-2035 RTP/SCS.

Determination of Significance

The methodology for determining the significance of geology, soil, seismicity, and mineral resources impacts compares the existing conditions to the future 2035 conditions under the Plan, as required by CEQA Guidelines Section 15126.2(a).

To assess potential impacts to residences and businesses adjacent to transportation corridors, Geographic Information Systems (GIS) was used to assess seismic and geologic impacts by overlaying data in GIS format on the location of areas known to pose seismic or geologic hazards. Specifically, the proposed projects and land use patterns included in the Plan were plotted on maps that identify potential hazards, such as known faults, high ground acceleration areas, areas exhibiting landslide potential, and areas with highly erodible soils in the SCAG region. A 300-foot-wide buffer (150 feet on either side) was projected along transportation project segments to identify potential seismic and geologic hazards and to determine whether such hazards could impact an RTP project.

IMPACTS

Impact 3.5-1: Implementation of the 2012 RTP/SCS could expose people or structures to potential substantial adverse effects including risk of surface rupture, ground shaking, liquefaction, landsliding or other seismically-induced hazards such as tsunami and seiche waves.

The entire SCAG region is susceptible to impacts from seismic activity. Seismic events can damage both transportation infrastructure through surface rupture, ground shaking, liquefaction, and landsliding. As shown in **Table 3.5-1**, numerous active faults are known to exist in the region that could potentially generate seismic events capable of significantly affecting existing structures and both transportation facilities included in the Plan and development. Therefore, RTP projects contained in the 2012-2035 RTP/SCS as well as anticipated development would be expected to be exposed to both direct and indirect effects of earthquakes over their lives. Potential direct impacts from surface rupture and severe ground shaking could cause catastrophic damage to transportation infrastructure, particularly overpasses and underground structures. Indirect impacts from seismic events could damage ancillary facilities such as port facilities, traffic control equipment, and train stations.

The 2012-2035 RTP/SCS includes new light rail transit (LRT) routes/extensions in Los Angeles and San Bernardino Counties, as well as other transit-related projects, would involve the construction of transit stations. All the existing highways and rail lines in the SCAG region are subject to seismic or geologic influences to some degree. Similarly, new highways, arterials, bus rapid transit (BRT) routes, goods movement (freight), heavy and light rail routes, high-speed train, and other capacity enhancements proposed in the 2012-2035 RTP/SCS would each be susceptible to impacts from seismic activity for at least some portion of its length.

Some proposed projects would be located within or across Alquist-Priolo Fault Zones. These zones are identified as areas directly over faults that are susceptible to surface rupture (see **Map 3.5-4** in the Map Chapter). In particular, the HST transit system would cross several Alquist-Priolo Zones including the San Andreas Fault Zone. Other projects would be located in areas known to experience severe ground acceleration during earthquakes making these areas susceptible to severe ground shaking and earth movement. Other projects would be located in areas prone liquefaction or erosion (such as the High Desert Corridor project) or in landslide-prone areas. **Table 3.5-5** lists 2012-2035 RTP/SCS project types, by county, for which construction projects have been proposed near areas of known seismically-induced severe ground acceleration, landslide, or liquefaction potential. In addition, indirect impacts could promote additional delays and breaks in service while repairs are made. The CGS, pursuant to the Seismic Hazards Act of 1990, has begun preparing seismic hazard maps of the Southern California region. These maps identify areas with high potential for exhibiting liquefaction. At this time only a portion of the SCAG region has been mapped. Therefore, specific information on areas prone to liquefaction or seismically induced land sliding is not yet available for each of the proposed projects. The potential for projects to be significantly affected by liquefaction would be higher in areas exhibiting shallow groundwater levels and unconsolidated soils such as fill material, some alluvial soils, and coastal sands.

TABLE 3.5-5: POTENTIAL IMPACTS OF SEISMIC AND GEOLOGIC HAZARDS ON REGIONAL TRANSPORTATION PROJECTS (BY COUNTY)

Project Type	Number of Projects	Ground Acceleration	Erosion	Landslide	Liquefaction
IMPERIAL COUNTY					
HST	0	0	0	N/A	N/A
HOT Toll	0	0	0	N/A	N/A
HOV	0	0	0	N/A	N/A
Mixed Flow	1	1	1	N/A	N/A
Urban Rail	0	0	0	N/A	N/A
Metrolink (Commuter Rail)	0	0	0	N/A	N/A
Freight Rail	10	8	10	N/A	N/A
LOS ANGELES COUNTY					
HST	1	1	1	1	1
HOT Toll	3	3	2	1	3
HOV	5	3	3	3	5
Mixed Flow	2	0	1	0	2
Urban Rail	16	3	14	1	14
Metrolink (Commuter Rail)	0	0	0	0	0
Freight Rail	25	3	17	0	13
ORANGE COUNTY					
HST	1	0	1	0	1
HOT Toll	3	1	0	2	3
HOV	5	0	3	3	5
Mixed Flow	11	1	9	3	11
Urban Rail	0	0	0	0	0
Metrolink (Commuter Rail)	0	0	0	0	0
Freight Rail	15	0	8	0	12
RIVERSIDE COUNTY					
HST	0	0	0	0	0
HOT Toll	4	3	3	0	0
HOV	2	2	2	1	1
Mixed Flow	6	4	6	0	0
Urban Rail	0	0	0	0	0

TABLE 3.5-5: POTENTIAL IMPACTS OF SEISMIC AND GEOLOGIC HAZARDS ON REGIONAL TRANSPORTATION PROJECTS (BY COUNTY)

Project Type	Number of Projects	Ground Acceleration	Erosion	Landslide	Liquefaction
Metrolink (Commuter Rail)	4	4	4	2	2
Freight Rail	57	25	18	0	0
SAN BERNARDINO COUNTY					
HST	0	0	0	NA	NA
HOT Toll	3	0	3	NA	NA
HOV	9	8	5	NA	NA
Mixed Flow	4	2	4	NA	NA
Urban Rail	0	0	0	NA	NA
Metrolink (Commuter Rail)	2	2	2	NA	NA
Freight Rail	33	17	13	NA	NA
VENTURA COUNTY					
HST	0	0	0	0	0
HOT Toll	0	0	0	0	0
HOV	0	0	0	0	0
Mixed Flow	2	1	2	2	2
Urban Rail	0	0	0	0	0
Metrolink (Commuter Rail)	0	0	0	0	0
Freight Rail	2	1	2	0	2

Note: Liquefaction and landslide data was not available, at the time of this analysis for Imperial, San Bernardino Counties and only available for a portion of Riverside County.
Freight rail projects in the 2035 Plan include grade separation projects and rail capacity enhancement projects.
SOURCE: SCAG GIS Analysis, 2011; California Geological Survey Seismic Hazard Mapping Program, USDA NRCS. August 2011.

As with the 1994 Northridge Earthquake, earthquakes can occur within previously undetected fault zones. Therefore, the potential exists for severe earthquakes to occur in unexpected locations throughout the SCAG region. Given the ubiquity of the transportation infrastructure in the region, future seismic activity from previously unknown faults could present catastrophic impacts to the network. Similarly, liquefaction potential can change over time in heavily landscaped areas such as parks and agricultural areas, as soil saturation is altered.

Seismic activity can cause damage to existing structures designed with substandard construction. However, new and recently seismically retrofitted structures designed with current engineering knowledge can reduce potential damage and harm to and within these structures. These earthquake-resistant structures can minimize the impact to public safety from seismic events. Nevertheless, new transportation infrastructure and facilities associated with implementation of the 2012-2035 RTP/SCS would expose additional people and infrastructure to the effects of earthquakes and seismically-induced landsliding. Similarly, the 2012-2035 RTP/SCS guides the distribution of growth through emphasis on development in HQTAs. While the specific impact of this pattern of development relative to seismic risk is unknown, it could result in more people being exposed to the effects of earthquakes and seismically-induced landsliding.

Seismically induced tsunami and seiche waves can damage transportation infrastructure proximate to coastal areas. Due to the localized nature of these impacts, local jurisdictions provide guidance and general oversight for tsunamis in coastal areas. For example, the City of Los Angeles General Plan Framework identifies a 12-foot run-up potential from a severe tsunami wave. Although building within this zone is not prohibited, certain early warning and emergency egress route systems are encouraged. Seiche waves could potentially exceed dam structures in the region and inundate low lying areas. Local water agencies, the State Department of Water Resources, and the federal Bureau of Reclamation are responsible for ensuring dam safety in the region including those from seismic events. Structural considerations have been included in each dam in the region to reduce potential failure. The transportation projects included in the 2012-2035

RTP/SCS are located more than two miles inland from the coast. The possibility of a tsunami affecting the SCAG project area is considered remote. Similarly damage to the proposed major highway projects and high quality transit areas (HQTA) projects in the SCAG region due to a seiche are not likely because no bodies of water are present. Due to the remote potential for the occurrence of tsunamis or seiche waves and the general oversight of management agencies, the effects on transportation infrastructure would not be considered significant.

Implementation of Mitigation Measures **MM-GEO1** through **MM-GEO3**, would reduce impacts related to surface rupture, ground shaking, liquefaction, landsliding or other seismically-induced hazards**;** however impacts remain significant.

Impact 3.5-2: Significant earthwork associated with implementation of the 2012-2035 RTP/SCS could result in substantial soil erosion and/or the loss of topsoil in some cases potentially resulting in slope failure.

Projects proposed in the 2012-2035 RTP/SCS would involve substantial construction of new facilities such as rail lines and highway segments, the majority of which would be within previously undisturbed areas. Therefore, the 2012-2035 RTP/SCS projects have the potential to result in soil erosion and loss of topsoil in previously undisturbed areas. Some of these projects could require significant earthwork including cuts into hillsides which can become unstable over time, increasing long-term erosion potential. Improvements and modifications to existing rights-of-way, such as HOV lanes, HOT lanes, new bus-ways and capacity enhancement facilities, mixed flow lanes, and right-of-way maintenance, would have less potential to impact topsoil because these project locations have previously been disturbed. However, road cuts could expose soils to erosion over the life of the project, creating potential landslide and falling rock hazards. Engineered roadways can be undercut over time by stormwater drainage and wind erosion. Some areas would be more susceptible to erosion than others due to the naturally occurring soils with high erosion potential.

Table 3.5-5, above, lists the types and general location of the Plan projects that would be located in areas with moderate or high erosion potential. Notwithstanding natural soil types, engineered soils can also erode due to poor construction methods and design features or lack of maintenance. Construction of additional lanes on freeways and other facilities could potentially result in the loss of topsoil, if it involves grading, trenching, excavation, and/or soil removal of any kind, in an area not previously used as a paved transportation facility. In addition, right-of-way maintenance has the potential to impact topsoil depending on activities involved.

The 2012-2035 RTP/SCS includes mobility and land use policies that aim to focus more than two-thirds of new development in existing areas near transit centers and other infrastructure, i.e., HQTAs. This focus on compact development would not be expected to result in an increase in slope instability as much of the anticipated development would be in already developed areas served by transit and other existing infrastructure. However, some of the anticipated development could require earthwork or otherwise result in soil erosion or slope failure. Since the 2012-2035 RTP/SCS also guides nearly one-third of growth near the new transit infrastructure, it is recommended that the additional earthwork be considered for the new development in both existing and future HQTAs.

Implementation of Mitigation Measures **MM-GEO4** through **MM-GEO6**, would reduce impacts to soil erosion and/or topsoil, however impacts remain significant.

Impact 3.5-3: Potential to be located on expansive soils, a geologic unit or soil that is unstable, or that would become unstable as a result of the Plan, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

Potentially significant impacts to property and public safety could occur due to subsidence, slope failure, and the presence of expansive soils. Subsidence has historically occurred within the SCAG region due to groundwater overdraft and petroleum extraction. Unconsolidated soils containing petroleum or groundwater often compress when the liquids are removed causing the surface elevation to decrease. Improperly abandoned oil wells or underground hard rock mining can also cause localized subsidence. Areas of historic subsidence within the SCAG region exist in the Santa Clara River Valley and in the historic oil and gas fields of Los Angeles County including the Baldwin Hills, Long Beach, and Puente Hills areas. The Port of Long Beach has also experienced subsidence due to the placement of fill along the original coast-line. Subsidence can also occur in areas with unconsolidated soils that have not historically shown elevation changes. Transportation infrastructure designs must include appropriate reinforcement to minimize potential impacts from subsidence in areas where such activity has not been witnessed.

Slope failure results in landslides and mudslides from unstable soils or geologic units. As discussed under Impact 3.5-2 above, construction of Plan projects may require significant earthwork and road cuts, increasing the potential for slope failure. Excavation related to construction projects proposed in the 2012-2035 RTP/SCS or as needed to construct anticipated development could result in unstable soils.

Soils with high percentages of clay can expand when wet, causing structural damage to surface improvements. These clay soils can occur in localized areas throughout the SCAG region, making it necessary to survey project areas extensively prior to construction. Each new project location would have the potential to contain expansive soils, although they are more likely to be encountered in lower drainage basin areas. Expansive soils are generally removed during foundation work to avoid structural damage. The 2012-2035 RT/SCS assumes 36 percent of the growth will occur within the existing HQTAs where expansive soils may have already been removed. The 2012-2035 RTP/SCS also assumes 16 percent of the growth will occur within the new HQTAs, it is recommended that the implementation of Mitigation Measures **MM-GEO7** through **MM-GEO10** be considered to reduce impacts to expansive soil . However, impacts could still remain significant.

Impact 3.5-4: Potential to result in the loss of availability of known aggregate and mineral resources that would be of value to the region and residents of the State.

According to the CGS, the State currently has approximately 4.3 billion tons of permitted resources and the CGS estimates the State will need approximately 13.5 billion tons of aggregate in the next 50 years.[12] California's construction industry is greatly dependent on readily available aggregate deposits that are within a reasonable distance to market regions. Aggregate is a low unit-value, high bulk-weight commodity; therefore, aggregate for construction must be obtained from nearby sources in order to minimize costs to the consumer. If nearby aggregate sources do not exist, then transportation costs quickly can exceed the value of the aggregate. **Map 3.5-8** shows the 50-year demand that will not be met in aggregate production areas in and around the SCAG region.

Table 3.5-3 shows that just under one third of the projected 50-year demand is currently permitted in the SCAG region (excluding mines in Imperial County).

The 2012-2035 RTP/SCS includes transportation system improvements, such as new or expanded highway/arterials, HOV lanes and connectors and new light and heavy rail, goods movement projects and

[12]Department of Conservation, Natural Resources Agency, State Mining and Geology Board Annual Report 2009-2010, *http://www.conservation.ca.gov/smgb/reports/Annual%20Reports/Documents/SMGB%2009-10%20AR%20Final%20Draft%20(041311).pdf*, accessed August 2011.

infrastructure associated with these projects. In addition, the mobility and land use policies contained within the 2012-2035 RTP/SCS would influence population distribution by focusing growth in HQTAs. The projects included in the 2012-2035 RTP/SCS as well as anticipated development would result in a demand for aggregate resources for construction. As a long-range planning document, the 2012-2035 RTP/SCS does not include specific construction information related to large transportation projects included in the Plan. However, it is anticipated that the projects included in the Plan as well as anticipated development would require substantial amounts of aggregate resources. Therefore, this impact would be significant.

In addition, 2012-2035 RTP/SCS includes transportation projects that have the potential to impact mineral resources because they could take place in previously undisturbed areas. In addition anticipated development has the potential to occur in mineral resource zones thus impacting the availability of these resources. Improvements and modifications to existing rights-of-way, such as HOV lanes, HOT lanes, new bus-ways and capacity enhancement facilities, mixed flow lanes, and right-of-way maintenance, would have less potential to impact mineral resources because these project locations have previously been disturbed. However, construction of additional lanes, would potentially impact geological and mineral resources, if it would entail grading, trenching, excavation, and/or soil removal of any kind, in an area not previously used as a paved transportation facility. Construction of additional lanes and right-of-way maintenance has the potential to impact aggregate and mineral resources. Since this document analyzes impacts to geological and mineral resources on a program level only, project-level analysis of impacts will also be necessary. Implementation of Mitigation Measures **MM-GEO11** through **MM-GEO12** would reduce impacts to aggregate and mineral resources impacts; however, impacts would remain significant.

Cumulative Impact 3.5-5: Potential to contribute to a cumulatively considerable increase in risk associated with geologic hazards and impacts to mineral resources.

Potentially hazardous geological and seismic factors are found throughout Southern California and are generally site specific. As the 2012-2035 RTP/SCS encompasses all development (both transportation and land use changes) that would occur in the region through 2035 and the impacts of that development are discussed fully above, the proposed project would not contribute to a cumulatively considerable increase in risk associated with geologic hazards. Implementation of Mitigation Measures **MM-GEO1** through **MM-GEO10** would reduce impacts related to geologic hazards; given the site-specific nature of geologic impacts it is not anticipated that the Plan would contribute to a cumulatively considerable increase in risk associated with geologic hazards.

Construction of RTP projects and anticipated development would result in a large demand for aggregate, also RTP projects and development could be constructed atop mineral resources thus impeding access to these resources. Given the potential for permitted resources to not meet demand both inside and outside the SCAG region the Plan would contribute to a cumulatively significant Statewide impact on aggregate resources. Implementation of Mitigation Measures **MM-GEO11** and **MM-GEO12** would reduce impacts related to aggregate resources but impacts would be a significant cumulative impact of the Plan.

MITIGATION MEASURES

Mitigation Measures **MM-GEO1** through **MM-GEO9** can and should be implemented by project sponsors (for both development and transportation projects) as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions. Mitigation Measures **MM-GEO10** and **MM-GEO11** shall be implemented by SCAG over the lifetime of the 2012-2035 RTP/SCS. Mitigation Measure **MM-GEO12** can and should be implemented by local jurisdictions over the lifetime of the 2012-2035 RTP/SCS.

Seismicity

MM-GEO1: Project sponsors can and should ensure that projects located within or across Alquist-Priolo Zones comply with design requirements provided in Special Publication 117, published by the California Geological Survey, as well as relevant local, regional, State, and federal design criteria for construction in seismic areas.

MM-GEO2: Project sponsors can and should ensure that projects are designed in accordance with county and city code requirements for seismic ground shaking. The design of projects should consider seismicity of the site, soil response at the site, and dynamic characteristics of the structure, in compliance with the appropriate California Building Code and State of California design standards for construction in or near fault zones, as well as all standard design, grading, and construction practices in order to avoid or reduce geologic hazards.

MM-GEO3: Project sponsors can and should ensure that site-specific geotechnical investigations conducted by a qualified geotechnical expert should be required prior to preparation of project designs. These investigations would identify areas of potential failure and recommend remedial geotechnical measures to eliminate any problems.

Soil Erosion

MM-GEO4: Project sponsors can and should ensure that site-specific geotechnical investigations conducted by a qualified geotechnical expert are conducted to ascertain soil types and local faulting prior to preparation of project designs. These investigations would identify areas of potential failure and recommend remedial geotechnical measures to eliminate any problems.

MM-GEO5: Project sponsors can and should ensure that project designs provide adequate slope drainage and appropriate landscaping to minimize the occurrence of slope instability and erosion. Design features should include measures to reduce erosion caused by stormwater. Road cuts should be designed to maximize the potential for revegetation.

MM-GEO6: Project sponsors can and should ensure that, prior to preparing project designs, new and abandoned wells are identified within construction areas to ensure the stability of nearby soils.

Expansive Soils

MM-GEO7: Project sponsors can and should ensure that projects avoid geologic units or soils that are unstable, expansive soils and soils prone to lateral spreading, subsidence, liquefaction, or collapse wherever feasible.

MM-GEO8: Project sponsors can and should ensure that projects avoid landslide areas and potentially unstable slopes wherever feasible.

MM-GEO9: Project sponsors can and should ensure that site-specific geotechnical investigations conducted by a qualified geotechnical expert should be required prior to preparation of project designs to identify the potential for subsidence and expansive soils. These investigations would identify areas of potential failure and recommend remedial geotechnical measures to eliminate any problems. Recommended corrective measures, such as structural reinforcement and replacing soil with engineered fill, should be implemented in project designs.

MM-GEO10: SCAG shall minimize future impacts to geological resources through cooperation, information sharing, and regional program development as part of SCAG's ongoing regional planning efforts, such as web-based planning tools for local government including CA Lots,

and direct technical assistance efforts such as Compass Blueprint's Toolbox Tuesday series. Resource agencies, such as the U.S. Geology Survey, should be consulted during this update process.

Aggregate and Mineral Resources

MM-GEO11: SCAG shall coordinate with the Department of Conservation, California Geological Survey to maintain a database of 1) available resources in the SCAG region including permitted and un-permitted and 2) the anticipated 50-year demand. Based on the results of this survey SCAG should work with local agencies on strategies to address anticipated demand, including identifying future sites that may seek permitting and working with industry experts to identify ways to encourage and increase recycling to reduce the demand for aggregate.

MM-GEO12: Local jurisdictions can and should review availability of aggregate and mineral resources in their jurisdiction and should develop a long-range plan to meet demand.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Seismicity

Implementation of Mitigation Measures **MM-GEO1** through **MM-GEO3** would reduce the potential impacts to the seismically active areas and Alquist-Priolo fault zones, due to the regional scale of the Plan; however, this impact would remain significant.

Soil Erosion

Implementation of Mitigation Measures **MM-GEO4** through **MM-GEO6** would reduce the potential impacts to the topography, ecology and meteorology of the SCAG region and the regional scale of the project; however, the impact would remain significant.

Expansive Soils

Implementation of Mitigation Measures **MM-GEO7** through **MM-GEO10** would reduce the potential impacts to geologic features of the SCAG region and the regional scale of the project; however, the impact would remain significant.

Aggregate and Mineral Resources

Implementation of Mitigation Measures **MM-GEO11** and **MM-GEO12** would reduce the potential impacts related to aggregate and mineral resources supply. However, due to the substantial growth and large number of projects anticipated in the Plan this impact would remain significant.

Cumulative Impacts

Geologic hazards are site-specific and significant cumulative impacts are not anticipated. The project would contribute to a statewide impact on mineral resources; this would be a significant cumulative impact.

COMPARISON WITH THE NO PROJECT ALTERNATIVE

Implementation of the 2012-2035 RTP/SCS would result in the same regional total population and households as the No Project Alternative. Population for both No Project and the Plan is projected to be approximately 22.1 million people. However, no regional transportation investments would be made beyond the existing programmed projects under the No Project Alternative. The population distribution is assumed

to follow past trends, uninfluenced by additional transportation investments and growth polices contained within the 2012-2035 RTP/SCS.

Direct Impacts

Under the No Project Alternative fewer areas would be impacted by excavation and construction activities associated with Plan projects, as the Plan includes the construction of a greater number of transportation projects than the No Project Alternative. Both the No Project and the Plan would expose the same number of people to potential seismic hazards. Under the Plan, development would be more concentrated potentially exposing more people to risk in specific locations, but overall the same population would be exposed to the same risk. Under the no Project Alternative, development would be anticipated to be less dense, which could result in less risk in the event of an earthquake.

The greater amount of transportation projects in the Plan would increase the amount of transportation infrastructure that would be subject to risk as a result of surface rupture, ground-shaking liquefaction, and landsliding and other risks associated with seismic events. The No Project Alternative would result in the construction of approximately 68,040 new lane miles compared with over 74,297 new lane miles in the 2012-2035 RTP/SCS. **Impacts related to geologic and seismic resources would be similar to the Plan under the No Project Alternative because the population would be the same and entire region is subject to seismic risk.**

The reduced amount of RTP projects would be expected to occur under the No Project Alternative could result in a decrease in the amount of aggregate and mineral resources demand in the region. However as more land would be consumed under the No Project Alternative (742 square miles compared to 334 square miles under the Plan), more local access roads are anticipated to be needed. The more compact development pattern under the Plan could use less aggregate per capita as more compact development is more efficient. **On balance it is anticipated that the No Project Alternative would result in greater impacts because dispersed development is less efficient in its use of aggregate as compared to a more compact development pattern.**

Cumulative Impacts

Compared to the Plan, the No Project Alternative would have site-specific impacts related to geologic risks. As under the Plan the no Project Alternative would result in a large demand for aggregate resources. As noted above this demand could be higher than under the Plan because of the increased consumption of land. Therefore cumulative impacts of the No Project Alternative are anticipated to be greater than under the Plan.

3.6 GREENHOUSE GAS EMISSIONS

This section describes the current greenhouse gas (GHG) emissions, discusses the construction and operational impacts of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (2012-2035 RTP/SCS or Plan), identifies mitigation measures for the impacts, and evaluates the residual impacts.

GHG emissions refer to a group of emissions that are generally believed to affect global climate conditions. The greenhouse effect compares the Earth and the atmosphere surrounding it to a greenhouse with glass panes. The glass panes in a greenhouse let heat from sunlight in and reduce the amount of heat that escapes. GHGs, such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), keep the average surface temperature of the Earth close to 60 degrees Fahrenheit (°F).

In addition to CO_2, CH_4, and N_2O, GHGs include hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and water vapor. Of all the GHGs, CO_2 is the most abundant pollutant that contributes to climate change through fossil fuel combustion. CO_2 comprised 83.3 percent of the total GHG emissions in California in 2002.[1] The other GHGs are less abundant but have higher global warming potential than CO_2. To account for this higher potential, emissions of other GHGs are frequently expressed in the equivalent mass of CO_2, denoted as CO_2e. The CO_2e of CH_4 and N_2O represented 6.4 and 6.8 percent, respectively, of the 2002 California GHG emissions. Other high global warming potential gases represented 3.5 percent of these emissions.[2] In addition, there are a number of human-made pollutants, such as CO, NO_X, non-methane VOC, and SO_2, that have indirect effects on terrestrial or solar radiation absorption by influencing the formation or destruction of other climate change emissions.

REGULATORY FRAMEWORK

Federal

Supreme Court Ruling. The U.S. Supreme Court ruled in *Massachusetts v. Environmental Protection Agency, 127 S.Ct. 1438 (2007)*, that carbon dioxide and other greenhouse gases are pollutants under the Federal Clean Air Act (CCA), which the U.S. Environmental Protection Agency (USEPA) must regulate if it determines they pose an endangerment to public health or welfare. On December 7, 2009 the USEPA Administrator made two distinct findings: 1) that the current and projected concentrations of the six key GHG [carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)] in the atmosphere threatens the public health and welfare of current and future generations; and 2) that the combined emissions of these greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

Energy Independence and Security Act. The Energy Independence and Security Act of 2007 includes several key provisions that will increase energy efficiency and the availability of renewable energy, which will reduce greenhouse gas emissions as a result. First, the Act sets a Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel by 2022. Second, it increased Corporate Average Fuel Economy (CAFE) Standards to require a minimum average fuel economy of 35 miles per gallon for the combined fleet of cars and light trucks by 2020. Third, the adopted bill includes a variety of new standards for lighting and for residential and commercial appliance equipment. The equipment includes residential

[1] Cal/EPA, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, March 2006, p. 11.
[2] *Ibid*.

refrigerators, freezers, refrigerator-freezers, metal halide lamps, and commercial walk-in coolers and freezers.

National Fuel Efficiency Policy. In addition, on May 19, 2009, President Barack Obama announced a new National Fuel Efficiency Policy aimed at increasing fuel economy and reducing greenhouse gas pollution.[3] The new National Fuel Efficiency Policy is expected to increase fuel economy by more than 5 percent by requiring a fleet-wide average of 35.5 miles per gallon by 2016 starting with model years 2012. However, federal fuel economy standards have not yet been promulgated to establish specific benchmarks.

The Heavy-Duty National Program was adopted on August 9, 21011 to establish the first fuel efficiency requirements for medium- and heavy-duty vehicles beginning with the model year 2014.

State

In response to growing scientific and political concern with global climate change, California adopted a series of laws to reduce emissions of GHGs into the atmosphere.

Assembly Bill 1493 (AB 1493). In September 2002, AB 1493 was enacted, requiring the development and adoption of regulations to achieve "the maximum feasible reduction of greenhouse gases" emitted by noncommercial passenger vehicles, light-duty trucks, and other vehicles used primarily for personal transportation in the State.

Executive Order (E.O.) S-3-05. On June 1, 2005, E.O. S-3-05 set the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

The Executive Order establishes State GHG emission targets of 1990 levels by 2020 (the same as AB 32) and 80 percent below 1990 levels by 2050. It calls for the Secretary of California Environmental Protection Agency (Cal/EPA) to be responsible for coordination of State agencies and progress reporting. A recent California Energy Commission report concludes, however, that the primary strategies to achieve this target should be major "decarbonization" of electricity supplies and fuels, and major improvements in energy efficiency.[4]

In response to the Executive Order, the Secretary of the Cal/EPA created the Climate Action Team (CAT). California's CAT originated as a coordinating council organized by the Secretary for Environmental Protection. It included the Secretaries of the Natural Resources Agency, and the Department of Food and Agriculture, and the Chairs of the Air Resources Board, Energy Commission, and Public Utilities Commission. The original council was an informal collaboration between the agencies to develop potential mechanisms for reductions in GHG emissions in the State. The council was given formal recognition in Executive Order S-3-05 and became the CAT.

The original mandate for the CAT was to develop proposed measures to meet the emission reduction targets set forth in the executive order. The CAT has since expanded and currently has members from 18 State agencies and departments. The CAT also has ten working groups which coordinate policies among their members. The working groups and their major areas of focus are:

- Agriculture: Focusing on opportunities for agriculture to reduce GHG emissions through efficiency improvements and alternative energy projects, while adapting agricultural systems to climate change;

[3]The White House, Office of the Press Secretary, May 19, 2009, *http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel-Efficiency-Policy/*.

[4]California Energy Commission, *California's Energy Future – The View to 2050*, May 2011.

- Biodiversity: Designing policies to protect species and natural habitats from the effects of climate change;
- Energy: Reducing GHG emissions through extensive energy efficiency policies and renewable energy generation;
- Forestry: Coupling GHG mitigation efforts with climate change adaptation related to forest preservation and resilience, waste to energy programs and forest offset protocols;
- Land Use and Infrastructure: Linking land use and infrastructure planning to efforts to reduce GHG from vehicles and adaptation to changing climatic conditions;
- Oceans and Coastal: Evaluating the effects sea level rise and changes in coastal storm patterns on human and natural systems in California;
- Public Health: Evaluating the effects of GHG mitigation policies on public health and adapting public health systems to cope with changing climatic conditions;
- Research: Coordinating research concerning impacts of and responses to climate change in California;
- State Government: Evaluating and implementing strategies to reduce GHG emissions resulting from State government operations; and
- Water: Reducing GHG impacts associated with the State's water systems and exploring strategies to protect water distribution and flood protection infrastructure.

The CAT is responsible for preparing reports that summarize the State's progress in reducing GHG emissions. The most recent CAT Report was published in December 2010. The CAT Report discusses mitigation and adaptation strategies, State research programs, policy development, and future efforts.

Assembly Bill 32 (AB 32). In September 2006, Governor Arnold Schwarzenegger signed the California Global Warming Solutions Act of 2006, also known as AB 32, into law. AB 32 focuses on reducing GHG emissions in California, and requires the ARB to adopt rules and regulations that would achieve greenhouse gas emissions equivalent to Statewide levels in 1990 by 2020. To achieve this goal, AB 32 mandates that the ARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce Statewide GHG emissions from stationary sources, and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved. Because the intent of AB 32 is to limit 2020 emissions to the equivalent of 1990, it is expected that the regulations would affect many existing sources of GHG emissions and not just new general development projects. Senate Bill (SB) 1368, a companion bill to AB 32, requires the California Public Utilities Commission and the California Energy Commission to establish GHG emission performance standards for the generation of electricity. These standards will also apply to power that is generated outside of California and imported into the State.

AB 32 charges ARB with the responsibility to monitor and regulate sources of GHG emissions in order to reduce those emissions. On June 1, 2007, ARB adopted three discrete early action measures to reduce GHG emissions. These measures involved complying with a low carbon fuel standard, reducing refrigerant loss from motor vehicle air conditioning maintenance, and increasing methane capture from landfills.[5] On October 25, 2007, ARB tripled the set of previously approved early action measures. The approved measures include improving truck efficiency (i.e., reducing aerodynamic drag), electrifying port equipment, reducing perfluorocarbons from the semiconductor industry, reducing propellants in consumer products, promoting proper tire inflation in vehicles, and reducing sulfur hexaflouride emission from the non-electricity sector. The ARB has determined that the total Statewide aggregated GHG 1990 emissions level and 2020 emissions limit is 427 million metric tons of CO_2e. The 2020 target reductions are currently estimated to be 174 million metric tons of CO_2e.

The ARB AB 32 Scoping Plan contains the main strategies to achieve the 2020 emissions cap. The Scoping Plan was developed by the ARB with input from the CAT and proposes a comprehensive set of actions designed to reduce overall carbon emissions in California, improve the environment, reduce oil dependency,

[5]California Air Resources Board, *Proposed Early Action Measures to Mitigate Climate Change in California*, April 20, 2007.

diversify energy sources, and enhance public health while creating new jobs and improving the State economy. The GHG reduction strategies contained in the Scoping Plan include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. Key approaches for reducing greenhouse gas emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a Statewide renewable electricity standard of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets; and
- Adopting and implementing measures to reduce transportation sector emissions, including California's.

ARB has also developed the GHG mandatory reporting regulation, which required reporting beginning on January 1, 2008 pursuant to requirements of AB 32. The regulations require reporting for certain types of facilities that make up the bulk of the stationary source emissions in California. The regulation language identifies major facilities as those that generate more than 25,000 metric tons of CO_2 per year. Cement plants, oil refineries, electric generating facilities/providers, co-generation facilities, and hydrogen plants and other stationary combustion sources that emit more than 25,000 metric tons of CO_2 per year, make up 94 percent of the point source CO_2 emissions in California.

CEQA Guidelines Amendments. California Senate Bill (SB) 97 required the Governor's Office of Planning and Research (OPR) to develop CEQA Guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions." The CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. Noteworthy revisions to the CEQA Guidelines include:

- Lead agencies should quantify all relevant GHG emissions and consider the full range of project features that may increase or decrease GHG emissions as compared to the existing setting;
- Consistency with the ARB Scoping Plan is not a sufficient basis to determine that a project's GHG emissions would not be cumulatively considerable;
- A lead agency may appropriately look to thresholds developed by other public agencies, including the ARB's recommended CEQA thresholds;
- To qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project. General compliance with a plan, by itself, is not mitigation;
- The effects of GHG emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impact analysis; and
- Given that impacts resulting from GHG emissions are cumulative, significant advantages may result from analyzing such impacts on a programmatic level. If analyzed properly, later projects may tier, incorporate by reference, or otherwise rely on the programmatic analysis.

Senate Bill 375 (SB 375). SB 375, adopted in September 30, 2008, provides a means for achieving AB 32 goals through the reduction in emissions of cars and light trucks. SB 375 requires new RTPs to include Sustainable Communities Strategies (SCSs). This legislation also allows the development of an Alternative Planning Strategy (APS) if the targets cannot be feasibly met through an SCS. The APS is not included as part of the RTP. In adopting SB 375, the Legislature expressly found that improved land use and

transportation systems are needed in order to achieve the GHG emissions reduction target of AB 32. Further, the staff analysis for the bill prepared for the Senate Transportation and Housing Committee's August 29, 2008 hearing on SB 375 (hereby incorporated by reference) began with the following statement: "According to the author, this bill will help implement AB 32 by aligning planning for housing, land use, transportation and greenhouse gas emissions for the 17 MPOs in the state."

Senate Bill 1078, Senate Bill 107, and Executive Order S-14-08 (Renewables Portfolio Standard). On September 12, 2002, Governor Gray Davis signed SB 1078 requiring California to generate 20 percent of its electricity from renewable energy by 2017. SB 107, signed by the Governor on September 26, 2006 changed the due date for this goal from 2017 to 2010. On November 17, 2008, Governor Arnold Schwarzenegger signed Executive Order S-14-08, which established a Renewables Portfolio Standard target for California requiring that all retail sellers of electricity serve 33% of their load with renewable energy by 2020. Increased use of renewable energy sources will decrease California's reliance on fossil fuels, reducing emissions of greenhouse gases from the energy sector.

Assembly Bill 1493 (Pavley Regulations). AB 1493 (referred to as Pavley I) required CARB to develop and adopt standards for vehicle manufacturers to reduce greenhouse gas emissions coming from passenger vehicles and light-duty trucks at a "maximum feasible and cost effective reduction" by January 1, 2005. Pavley I took effect for model years starting in 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG" will cover 2017 to 2025. Fleet average emission standards would reach 22% reduction by 2012 and 30% by 2016.

Executive Order (E.O.) S-1-07, the Low Carbon Fuel Standard. On January 18, 2007 E.O. S-1-07 was issued requiring a reduction of at least ten percent in the carbon intensity of California's transportation fuels by 2020. Regulatory proceedings and implementation of the Low Carbon Fuel Standard have been directed to the California Air Resources Board (ARB). The Low Carbon Fuel Standard has been identified by ARB as a discrete early action item in the Adopted *Climate Change Scoping Plan*. ARB expects the Low Carbon Fuel Standard to achieve the minimum 10 percent reduction goal; however, many of the early action items outlined in the *Climate Change Scoping Plan* work in tandem with one another. To avoid the potential for double-counting emission reductions associated with AB 1493 (see previous discussion), the *Climate Change Scoping Plan* has modified the aggregate reduction expected from the Low Carbon Fuel Standard to 9.1 percent.

Executive Order S-13-08. Executive Order S-13-08, signed on November 14, 2008, directs California to develop methods for adapting to climate change impacts through preparation of a statewide plan. In response to this order, the California Natural Resources Agency coordinated with ten State agencies, multiple scientists, a consulting team, and stakeholders to develop the first Statewide, multi-sector adaptation strategy in the country. The resulting report, *2009 California Climate Adaptation Strategy*, summarizes the best-known science to assess the vulnerability of the State to climate change impacts, and outlines possible solutions that can be implemented within and across State agencies to promote resiliency. This strategy is the first step in an evolving process to reduce California's vulnerability to climate change impacts.

Adaptation refers to efforts that prepare the State to respond to the impacts of climate change – adjustments in natural or human systems to actual or expected climate changes to minimize harm or take advantage of beneficial opportunities. California's ability to manage its climate risks through adaptation depends on a number of critical factors. These include its baseline and projected economic resources, technology, infrastructure, institutional support and effective governance, public awareness, access to the best available scientific information, sustainably-managed natural resources, and equity in access to these resources.

California's Energy Efficiency Standards for Residential and Nonresidential Buildings. Located at Title 24, Part 6 of the California Code of Regulations and commonly referred to as "Title 24," these energy efficiency standards were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible

incorporation of new energy efficiency technologies and methods.[6] The most recent update to Title 24 was adopted by the California Energy Commission on April 23, 2008. The requirement for when the 2008 standards must be followed is dependent on when the application for the building permit is submitted. If an application for a building permit is submitted on or after January 1, 2010, the 2008 standards must be met. The California Energy Commission adopted the 2008 changes to the Building Energy Efficiency Standards to respond to the mandates of AB 32 and to pursue California energy policy that energy efficiency is the resource of first choice for meeting California's energy needs.

Senate Bill 1368. SB 1368 (2006) directs the California Energy Commission and the California Public Utilities Commission to adopt a performance standard for greenhouse gas emissions for the future electricity used in California, regardless of whether it is generated in-state or purchased from other states.

California Green Building Code. The California Green Building Code (2008) referred to as "CalGreen," is the first statewide green building code. It was developed to provide a consistent, approach for green building within California. Taking effect January 2011, it lays out minimum requirements for newly constructed buildings in California, which will reduce greenhouse gas emissions through improved efficiency and process improvements. It requires builders to install plumbing that cuts indoor water use by as much as 20 percent, to divert 50 percent of construction waste from landfills to recycling, and to use low-pollutant paints, carpets, and floors.

Senate Bill 1 (Million Solar Roofs). SB 1 (2006) sets a goal to install 3,000 megawatts of new solar capacity by 2017 - moving the state toward a cleaner energy future and helping lower the cost of solar systems for consumers. The Million Solar Roofs Program is a ratepayer-financed incentive program aimed at transforming the market for rooftop solar systems by driving down costs over time. It provides up to $3.3 billion in financial incentives that decline over time.

Assembly Bill 811 (AB 811). AB 811 (2008) authorizes California cities and counties to designate districts within which willing property owners may enter into contractual assessments to finance the installation of renewable energy generation and energy efficiency improvements that are permanently fixed to the property. These financing arrangements would allow property owners

Regional

South Coast Air Quality Management District (SCAQMD). SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the Air Quality Management Plan. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy.

SCAQMD released draft guidance regarding interim CEQA GHG significance thresholds. In its October 2008 document, the SCAQMD proposed the use of a percent emission reduction target (e.g., 30 percent) to determine significance for commercial/residential projects that emit greater than 3,000 metric tons per year. On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for stationary source/industrial projects where the SCAQMD is lead agency. However, SCAQMD has yet to adopt a GHG significance threshold for land use development projects (e.g., residential/commercial projects) and has formed a GHG Significance Threshold Working Group to further evaluate potential GHG significance thresholds.[7]

SCAQMD has convened a GHG CEQA Significance Threshold Working Group to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. Members of the

[6]The California Energy Commission, California's Energy Efficiency Standards for Residential and Nonresidential Buildings, *Title 24, Part 6, of the California Code of Regulations*, http://www.energy.ca.gov/title24, accessed August, 2011.

[7]South Coast Air Quality Management District, *Greenhouse Gases (GHG) CEQA Significance* Thresholds, http://www.aqmd.gov/ceqa/handbook/GHG/GHG.html, accessed August, 2011.

working group include government agencies implementing CEQA and representatives from various stakeholder groups that will provide input to the SCAQMD staff on developing CEQA GHG significance thresholds. The working group is currently discussing multiple methodologies for determining project significance. These methodologies include categorical exemptions, consistency with regional GHG budgets in approved plans, a numerical threshold, performance standards, and emissions offsets.

Counties

Los Angeles County. The Los Angeles County Office of Sustainability (COS) was created within the Internal Services Department by the Board of Supervisors in October 2009 to respond to legislation, regulation and policy related to Climate Change and serve as a central hub to coordinate Energy Efficiency, Conservation and Sustainability Programs within the County, its facilities, and the region. The COS develops and implements programs that impact and benefit the constituents of Los Angeles County, such as the Energy Upgrade California in Los Angeles County energy efficiency home improvement and rebate program, countywide Environmental Service Centers, the SolarMap LACounty.gov and Green.LACounty.gov websites, and the Los Angeles Regional Collaborative for Climate Action and Sustainability. In addition, COS is the lead in coordinating and implementing Energy and Environmental policy programs and activities by all County departments.

Orange County. In early 2010, a joint committee with equal representation from the Orange County Council of Governments (COG) and the Orange County Transportation Authority (OCTA) was formed to develop the Orange County Sustainable Communities Strategy (SCS). The Orange County COG/OCTA SCS Joint Working Committee led overall efforts to develop a subregional Orange County SCS to meet the requirements of SB 375 and the mutual agreements with SCAG with a plan that all local jurisdictions in Orange County could support. As a result of this collaborative effort, the Orange County SCS was adopted unanimously by the OCTA and Orange County COG Boards of Directors in June of 2011. Orange County SCS utilizes the transportation system along with land use and Best Management Practices strategies to help the County to achieve the State-mandated emissions reduction targets.

Riverside County. Riverside County has created a Green Action Plan to establish a clear path to sustainability and GHG reduction. The Green Action Plan focuses on seven key areas: Energy, Greenhouse Gas Emissions, Waste, Urban Design, Urban Nature, Transportation and Water. The Energy section of the guidebook includes goal to increase the use of non-greenhouse gas emitting energy to 70 percent with at least 50 percent coming from renewable sources by 2020. The Plan has established a target to reduce GHG emissions by 7 percent below 1990 baseline and 15 percent below the baseline by 2020. The County aims to reduce waste by 75 percent by 2020 based on the 2007 per capita baseline. The Plan also provides incentives to increase green development and encourage the planting of at least 3,000 shade trees on private property and 1,000 trees in parks annually. For Transportation, the Plan envisions a 15 percent decrease in vehicle miles traveled by 2015 based on the 2009 baseline. The waters section specifies a 20 percent water usage reduction by 2020 while increasing the use of recycled water by 30 percent by 2020 based on the 2008 baseline.[8]

San Bernardino County. Santa Bernardino County launched *Green County San Bernardino* in August 2007 to promote the use of environmentally friendly technologies and practices among business owners, developers, and residents in the County. All San Bernardino County cities are encouraged to join the Green Valley Initiatives to pledge to address five or more policy areas that aim to reduce greenhouse gas emissions. The policy areas to select from are Green Building Program, Buy Green/Buy Local, Green Business Programs, Conservation and Recycling, Solar and Alternative Energy, Encourage Green Economic Development, Green Valley Land Use, and Green Valley Coordinators. The Green Building Program promotes the development and support for policies such as US Green Building Council's Leadership in

[8]Green Riverside, *Green Action Plan*, http://www.greenriverside.com/About-Green-Riverside-4/Green-Action-Plan-190, accessed August 2011.

Energy and Environmental Design (LEED)-certifiable commercial buildings and remodels and incorporates the California Green Builder program for residences. Buy green/buy local support Energy Star, California Friendly and other locally grown and manufactured products. Green Business Programs promote businesses that create green products and to support businesses that help employee live close to work or encourage telecommuting. The Conservation and Recycling area aims to reduce waste generation, increase reuse or recycling programs, and expand recycled and gray water systems for landscape irrigation. Cities who pledged to address Solar and Alternative Energy policy will provide motivation to manufacture, deploy, and locally use solar and other alternative energies for peak needs. The Green Economic Development and Green Valley Land Use within the Green Valley Initiatives will focus on increasing the number of green technology jobs in the region, as well as government infrastructure investments on areas where housing and jobs are coordinated to reduce vehicle emissions.[9]

Ventura County. The County of Ventura is in the process of developing a Climate Action Plan. The Plan will focus on compliance with AB 32 and reduce GHG emissions by aligning transportation needs with housing needs.

Cities

Many cities in the SCAG region have incorporated climate change and GHG policies into their planning and permitting programs. A complete list of cities that have incorporated climate change and GHG policies is found in the SCS.

The City of Los Angeles has issued guidance promoting green building to reduce GHG emissions. The goal of the Green LA Action Plan (Green LA Plan) is to reduce greenhouse gas emissions 35 percent below 1990 levels by 2030.[10] The Green LA Plan identifies objectives and actions designed to make the City of Los Angeles a leader in confronting global climate change. The measures would reduce emissions directly from municipal facilities and operations, and create a framework to address City-wide GHG emissions. The Green LA Plan lists various focus areas in which to implement GHG reduction strategies. Focus areas listed in the Green LA Plan include energy, water, transportation, land use, waste, port, airport, and ensuring that changes to the local climate are incorporated into planning and building decisions.

In furtherance of the Green LA Plan, the City of Los Angeles adopted an ordinance to establish a green building program in April 2008. The ordinance establishes green building requirements for projects involving 50 or more dwelling units. The Green Building Program was established to reduce the use of natural resources, create healthier living environments and minimize the negative impacts of development on local, regional, and global ecosystems. The program addresses location, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality.

The City of Santa Monica released the Santa Monica Sustainable City Plan in September 1994, with updates and revisions to the Santa Monica Sustainable City Plan adopted in February 2003, and October 2006. The Santa Monica Sustainable City Plan was initiated with the goals and strategies for City government and all sectors of the community to conserve and enhance local resources, safeguard human health and the environment, maintain a healthy and diverse economy, and improve the livability and quality of life in the City of Santa Monica. To that end, the Santa Monica Sustainable City Plan has set GHG emissions reduction targets for the City in order to address climate change impacts; these targets, if achieved, would result in greater GHG emissions reductions than those set by the State, at least in the short term. The Sustainable City Plan includes targets of reducing GHG emissions at least 30 percent below 1990 levels by 2015 for City government operations and 15 percent below 1990 levels by 2015 Citywide.

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[9]San Bernardino County, *Green Valley Initiative Cities*, http://www.sbcounty.gov/greencountysb/green_valley_initiative_cities.aspx, accessed August 2011.

[10]City of Los Angeles, *Green LA: An Action Plan to Lead the Nation in Fighting Global Warming*, May 2007.

To help meet the goals of the Santa Monica Sustainable City Plan, in 2000, the Santa Monica City Council adopted a set of green building requirements for public and private sector buildings. These requirements addressed energy efficiency and construction and demolition waste recycling. They were later expanded to include green construction materials and landscape water conservation requirements. Since 2000, the City has required that new buildings be approximately 15 percent more efficient than State law requires, on average. The City has also adopted a policy for new municipal buildings to achieve at least a Silver rating by the LEED rating system.

EXISTING SETTING

GHGs are the result of both natural and human-influenced activities. Forest fires, decomposition, industrial processes, landfills, and consumption of fossil fuels for power generation, transportation, heating, and cooling are the primary sources of greenhouse gas emissions. Without human intervention, the Earth maintains an approximate balance between the emission of GHGs into the atmosphere and the storage of greenhouse gases in oceans and terrestrial ecosystems. Increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.), have contributed to the rapid increase in atmospheric levels of GHGs over the last 150 years.

The primary effect of rising global concentrations of atmospheric GHG levels has been a rise in the average global tropospheric temperature of approximately 0.2 degrees Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling using 2000 emission rates shows that further warming is likely to occur given the expected rise in global atmospheric GHG concentrations from innumerable sources of GHG emissions worldwide,[11] which would induce further changes in the global climate system during the current century. Adverse impacts from global climate change worldwide and in California may include but may not be limited to:

- Declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;[12]
- Rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets;[13]
- Changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;[14]
- Declining Sierra snowpack levels, which account for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years;[15]
- Increasing the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas located in the Southern California area and the San Joaquin Valley by the end of the 21st Century;[16] and

[11] See, e.g., Environmental Protection Agency, Draft Endangerment Finding, 74 Fed. Reg. 18886, 18904 (April 24, 2009) ("cumulative emissions are responsible for the cumulative change in the stock of concentrations in the atmosphere"); see also 74 Fed. Reg. 66496, 66538 (same in Final Endangerment Finding).

[12] *Ibid*.

[13] Intergovernmental Panel on Climate Change, "Climate Change 2007."

[14] *Ibid*.

[15] California Environmental Protection Agency, Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature. 2006.

[16] *Ibid*.

- Increasing the potential for erosion of California's coastlines and seawater intrusion into the Sacramento Delta and associated levee systems due to the rise in sea level.[17]

Scientific understanding of the fundamental processes responsible for global climate change has improved over the past decade, and predictive capabilities are advancing. However, there remain significant scientific uncertainties, for example, in predictions of local effects of climate change, occurrence of extreme weather events, and effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the Earth's climate system, the uncertainty surrounding climate change may never be completely eliminated. Because of these uncertainties, there continues to be significant debate as to the extent to which increased concentrations of GHGs have caused or will cause climate change, and with respect to the appropriate actions to limit and/or respond to climate change. In addition, it may not be possible to link specific development projects to future specific climate change impacts., though estimating project-specific impacts is possible.

State of California

California is the fifteenth largest emitter of GHG on the planet, representing about two percent of the worldwide emissions.[18] **Table 3.6-1** shows the California GHG emissions inventory for years 2000 to 2008. 2008 saw a small decrease in Statewide GHG emissions, driven by a noticeable drop in on-road transportation emissions. 2008 also reflects the beginning of the economic recession and fuel price spikes. According to the ARB, as the economy recovers, GHG emissions are likely to rise again without other mitigation actions.

TABLE 3.6-1: CALIFORNIA GREENHOUSE GAS EMISSIONS INVENTORY

	CO_2e Emissions (Million Metric Tons)								
Sector	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Transportation	171	174	180	178	182	184	184	184	175
Electric Power	104	121	106	110	120	111	108	111	116
Commercial and Residential	44	41	44	41	43	41	41	42	43
Industrial	97	95	97	96	91	91	90	94	93
Recycling and Waste	6.2	6.3	6.2	6.3	6.2	6.5	6.6	6.5	6.7
High Global Warming Potential	11	11	12	13	14	14	15	15	16
Agriculture	25	25	28	28	29	29	30	28	28
Forest Net Emissions	(4.7)	(4.5)	(4.4)	(4.3)	(4.3)	(4.2)	(4.0)	(4.1)	(4.0)
Emissions Total	**453**	**469**	**470**	**469**	**480**	**473**	**471**	**477**	**474**

SOURCE: ARB, *California Greenhouse Gas Inventory*, 2011.

The Transportation sector – largely the cars and trucks that move people and goods – is the largest contributor with 36.5 percent of the State's total GHG emissions in 2008. On road emissions (from passenger vehicles and heavy duty trucks) constitute 93 percent of the transportation sector total. On road emissions grew to a maximum of 170.8 million metric tons of CO_2e in 2005, plateaued until 2007, and decreased in 2008 to 163.3 million. The amount of gasoline and diesel fuel consumed by on road vehicles followed a similar trend.

The Electricity and Commercial/Residential Energy sector is the next largest contributor with more than 30 percent of the Statewide GHG emissions. Although electricity imported into California accounts for only about a quarter of our electricity, imports contribute more than half of the GHG emissions from electricity because much of the imported electricity is generated at coal-fired power plants. AB 32 specifically requires ARB to address emissions from electricity sources both inside and outside of the State.

[17]California Environmental Protection Agency, Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature. 2006.

[18]ARB, *Climate Change Scoping Plan*, December 2008.

California's industrial sector includes refineries, cement plants, oil and gas production, food processors, and other large industrial sources. This sector contributes almost 20 percent of California's GHG emissions, but the sector's emissions are not projected to grow significantly in the future. The sector termed recycling and waste management is a unique system, encompassing not just emissions from waste facilities but also the emissions associated with the production, distribution and disposal of products throughout the economy.

Although high global warming potential gases are a small contributor to historic GHG emissions, levels of these gases are projected to increase sharply over the next several decades, making them a significant source by 2020.

The Forest sector is unique in that forests both emit GHG and absorb CO_2. While the current inventory shows forests as a sink of 4.7 million metric tons of CO_2e, carbon sequestration has declined since 1990. For this reason, the 2020 projection assumes no net emissions from forests.

The agricultural GHG emissions shown are largely methane emissions from livestock, both from the animals and their waste. Emissions of GHG from fertilizer application are also important contributors from the Agricultural sector. ARB has begun a research program to better understand the variables affecting these emissions. Opportunities to sequester CO_2 in the Agricultural sector may also exist; however, additional research is needed to identify and quantify potential sequestration benefits.

In December 2007, ARB approved a GHG emissions target for 2020 equivalent to the State's calculated GHG emissions level in 1990. ARB developed the 2020 target after extensive technical work and a series of stakeholder meetings. The 2020 target of 427 million metric tons of CO_2e requires the reduction of 169 million metric tons of CO_2e, or approximately 30 percent, from the State's projected 2020 emissions of 596 million metric tons of CO_2e (business-as-usual) and the reduction of 42 million metric tons of CO_2e, or almost ten percent, from 2002 to 2004 average emissions.

SCAG Region

SCAG is in the process of developing GHG emissions inventories for various emissions sources. These inventories have not been completed at the time of this analysis. The most recent emissions inventory for the SCAG region was estimated in the 2008 RTP EIR. It was estimated that in 2008, construction activities, mobile sources, electricity generation, and natural gas consumption generated 177 million metric tons of GHG emissions. Regional emissions vary by climate. Similar climates have been aggregated into climate zones. Climate zones in the SCAG region are shown in **Map 3.6-1** in Chapter 8 (Maps).

THRESHOLDS OF SIGNIFICANCE

The 2012-2035 RTP/SCS would have a significant impact related to greenhouse gas emissions if it would

- Increase GHG emissions compared to existing conditions (2011);
- Conflict with AB 32 or other applicable plan, policy or regulation adopted for the purpose of reducing emissions of greenhouse gases; or
- Conflict with SB 375 GHG emission reduction targets.

CEQA Guidelines Section 15064.4(a) confirms that lead agencies retain the discretion to determine the significance of GHG emissions. The Guidelines advise lead agencies to consider the following factors in determining the significance of GHG emissions: whether the project increases or reduces GHG emissions compared to the existing environmental setting, whether project emissions exceed a threshold of significance identified by the lead agency as appropriate to the project, and the extent to which the project compiles with regulations or requirements of certain adopted GHG reduction plans. (CEQA Guidelines Section 15064.4(b).) But fundamentally, the courts recognize that lead agencies are allowed to decide what threshold

of significance they will apply to a project. (See *Citizens for Responsible Equitable Development v. City of Chula Vista* (2011) 197 Cal.App. 4th 327, upholding an AB 32-based approach to setting significance thresholds.)

This PEIR uses three thresholds of significance: increase in GHG emissions compared to existing conditions, conflict with SB 375 GHG emission reduction targets, and conflict with other applicable GHG reduction plans. SCAG selected the SB 375-based threshold, because complying with SB 375 is the responsibility of this Plan. The other two thresholds are also consistent with CEQA Guidelines suggestions.

SCAG chose not to use the 2050 Executive Order emissions reduction target as a threshold of significance because the Executive Order is not an adopted GHG reduction plan within the meaning of CEQA Guidelines Section 15064.4(b)(2), and furthermore, the 2050 target is well beyond the horizon year (2035) of the Plan. Although the Attorney General has advised that the Executive Order 2050 target can *inform* CEQA analysis, there is no requirement to use it as a threshold of significance. Further, the Plan, in meeting its SB 375 2035 target is in line with the goals of the Executive Order.

Methodology

The following section summarizes the methodology used to evaluate the expected impacts of implementation of the Plan on GHG emissions.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of GHG emissions includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan (No Project Alternative) were adopted. This evaluation is not included in the determination of the significance of impacts (which is based on a comparison of future conditions with the Plan to existing conditions); however, it provides a meaningful perspective on the effects of the Plan.

Determination of Significance

Analysis of the potential GHG impacts of the Plan was conducted based on detailed modeling of on-road and gross estimates of stationary sources.

The GHG analysis calculates the mobile emissions associated with the 2012-2035 RTP/SCS using SCAG's Regional Travel Demand Model outputs and ARB's EMFAC2007 emissions model. Stationary source GHG emissions were calculated using the Rapid Fire Model (see Appendix E). Construction-related GHG emissions were calculated using the California Emissions Estimator Model (CalEEMod). In the analysis below, future year emissions are compared to 2005, 2011 and 15% below 2005. Estimates of energy and water use are based on 1) current demand factors and 2) emission rates associated with current power generation operations and water supply.

It is anticipated that future conservation (as a result of increased pressure to conserve and increased prices) will result in reduced demand. As energy providers and water suppliers respond to AB 32 and the Scoping Plan emission rates associated with power and water delivery are anticipated to decrease. However, in order to present a conservative analysis and without specific information on future demand factors, only modest reductions in demand are assumed. It is anticipated that AB 32 will be implemented, but at the present time sector-specific improvement cannot be quantified for this analysis.

IMPACTS

Impact 3.6-1: Under the Plan, GHG emissions from residential and commercial building construction and operational energy demand and total mobile source emissions would increase (from 141 million metric tons) when compared to existing conditions (130 million metric tons). Therefore, the Plan would result in a significant impact related to total emissions.

The GHG emissions resulting from the Plan would be significant if the project caused an increase over existing (2011) levels. This impact threshold has been developed for use in this PEIR based on CEQA's requirement that impacts be compared to existing conditions. However, since existing rates of GHG emissions are already harmful to the environment it is necessary that existing emissions be reduced in order to reduce climate change.

In addition to transportation improvements, the Plan identifies projected growth for the SCAG region in accordance with policies identified to reduce vehicle trips and vehicle trip length. Between 2011 and 2035 the region is anticipated to experience substantial increases in population, households and jobs (see Chapter 2 Project Description and Section 3.10 Population and Housing). The Plan focuses development in a compact pattern, which reduces per capita GHG emissions as compared to No Project or business-as-usual (BAU) because compact development generally uses less energy (e.g., multi-family housing units are insulated by each other as compared to single-family units and, therefore, require less heating and cooling) and water (e.g., multi-family units have less landscaping requiring irrigation as compared to single-family units).

GHG emissions result from direct and indirect sources. Direct emissions include emissions from fuel combustion in vehicles (i.e., autos, trucks, trains, buses, planes ships and trains) and natural gas combustion from stationary sources. Indirect sources include off-site emissions occurring as a result of electricity and water consumption and solid waste. Regional GHG emissions are estimated for years 2011 and 2035. Forecasts of regional GHG emissions for 2035 have been developed for this PEIR using SCAG's regional growth factors and anticipated growth under the Plan.

In addition, construction activities (of both transportation projects and development) throughout implementation of the Plan will result in direct and indirect emissions. Construction activities, including worker vehicle trips, transport of materials to and from the construction site, and operation of construction equipment, result in GHG emissions. Construction of individual projects occurs over a relatively short period of time as compared to the life of a project. Emissions due to construction activities are often amortized over the life of a project (e.g., 30 years).

Typically, individual project construction characteristics are identified, such as the timing of construction phases and equipment fleet mix. However, due to the scale of construction activity associated with implementation of the Plan, construction would be expected to occur continuously throughout the life of the Plan as individual projects are constructed and, therefore, could result in significant emissions. Although annual construction-related GHG emissions would be expected to vary depending on the number and type of projects being constructed in a given year (which would vary according to the economy), for purposes of this analysis annual construction emissions were estimated based on forecasted development in the region.

To estimate annual construction emissions due to development, total development was estimated based on forecasted housing units and jobs. The total number of residential projects was obtained based on annual household growth and assuming each residential project accounted for 100 units. Emissions from one 100-unit residential project was obtained from CalEEMod and used to determine emissions for total residential projects. Job growth was converted into nonresidential square footage based on SCAG's Employment Density Study Summary Report.[19] Similar to the residential analysis, nonresidential emissions were estimated based on one 250,000-square-foot project.

Non-mobile emissions associated with growth and development were analyzed using the Rapid Fire Model. A core concept in the Rapid Fire model is the allocation/designation of growth (in population, housing, and jobs) to one of three Land Development Categories (LDCs). The LDCs are Urban, Compact, and Standard. Urban is the most intense and most mixed LDC, often found within and directly adjacent to moderate and high-density urban centers. The Compact LDC is less intense than the Urban LDC, but highly walkable with rich mix of retail, commercial, residential, and civic uses. The Compact form is likely to occur as new growth on the urban edge or large-scale redevelopment. The Standard LDC represents the majority of separate-use auto-oriented development that has dominated the American suburban landscape over the past decades. See Appendix E for a detailed discussion of the Rapid Fire Model methodology.

Energy use factors for the four building types by which all new homes are categorized – single-family large lot, single-family small lot, single-family attached, and multifamily – were derived from the CEC Residential Appliance Saturation Survey (RASS) dataset. The RASS data includes per-unit electricity and gas consumption factors by climate zone (California Title 24 building climate zones), building type, and building size. Average per-square foot energy use for new and existing commercial buildings was estimated using the CEC Commercial End-Use Survey (CEUS) dataset. GHG emissions rate baselines and projections are based on California's statewide energy portfolio. The projected rates are made for the scenario horizon years of 2020 and 2035, with rates following a straight-line trend in between. The emissions rate for electricity generation is expected to decline over time, while that for natural gas use is expected to remain constant. The Plan assumes modest improvements in the electricity generation portfolio over time, with increases to about 28 percent renewables by 2020, and 35 percent by 2035. Emissions from natural gas combustion remain constant. The building energy emission rates are summarized in **Table 3.6-2**.

TABLE 3.6-2: BUILDING ENERGY GHG EMISSION RATES

Source	2005	2020	2035
Electricity Emissions (lbs/kWh)	0.81	0.69	0.62
Natural Gas Emissions (lbs/therm)	11.7	11.7	11.7

SOURCE: SCAG, 2012-2035 RTP/SCS, SCS Background Documentation Appendix, Page 61, 2011

Residential water use is calculated as a function of three basic sets of assumptions: a) average base-year water use for existing units; b) base-year water use for new units by building type; and c) reductions in building water use resulting from advances in water efficiency policy and technology. Average water use for existing units is assumed to be approximately 0.5 acre-feet per household per year. For new units, indoor water use is based on per-capita average rates by type, while outdoor water use is based on lot size and irrigation assumptions, evapotranspiration zone, and reference evapotranspiration according to the California Irrigation Management Information System. Water use reductions are applied to reflect an assumption of modest improvements in building efficiency standards. By 2035, the residential water use of new units is assumed to be 20 percent lower than baselines. The GHG emissions rates for water-related energy use are assumed to be the same as for building energy use shown in **Table 3.6-2**, above.

Sources of land use (residential and commercial) emissions assessed in the GHG analysis include construction, building energy consumption (electricity and natural gas), and water-related energy

[19]SCAG, *Employment Density Study Summary Report*, October 31, 2001.

consumption. Emissions not related to residential and commercial land uses (agricultural and industrial emissions, planes, trains and ships) are not included in this analysis since 1) the Plan would not have the ability to affect these emissions sectors, and 2) estimates of emissions associated with these sectors requires detailed understanding of acres of land in production, farming techniques, numbers of trips, engine sizes, length of travel in regional air or waters and detailed understanding of industrial processes some of which have not yet been invented. Emissions not included in the following analysis are related to the following: solid waste, waterborne navigations, trains, aviation, agricultural uses, ozone depleting substances commercially produced (e.g., hydrofluorocarbons), and industrial processes.

Forecast increases in population and jobs induce land use change (development projects), resulting in direct and indirect GHG emissions. The Plan supports sustainable growth through a compact development pattern. The Plan focuses growth in existing urban regions, where transit and infrastructure are already in place. Locating people and jobs near each other and near transit encourages use of transit, carpooling, and active transportation options (biking and walking), thereby reducing vehicle trips and trip lengths and associated emissions on a per capita basis. Encouraging multi-family developments instead of single-family homes also reduces energy and water consumption on a per capita basis.

GHG emissions from construction are generally associated with construction equipment and worker trips. Construction equipment typically consists of heavy-duty vehicles that are not subject to the same efficiency regulations that passenger vehicles must follow (e.g., Pavley), although their emissions benefit from lower carbon intensity fuel regulations, such as the low carbon fuel standards. The Heavy-Duty National Program, adopted on August 9, 21011, is expected to increase fuel efficiency by between 7 and 20 percent for medium- and heavy-duty vehicles. However, these efficiencies would be gradual, beginning in 2014, and would depend on the turnover rate of vehicles. Even with reduced emissions, these vehicles would still result in GHG emissions in 2035, and the regulations would not apply to all construction equipment.

On-road transportation emissions include fuel consumption from passenger vehicles, heavy-duty trucks, buses, and other motor vehicles. Transportation accounts for the greatest proportion of GHG emissions on a regional and State level. As part of the Plan, transportation network improvements would be made and compact, mixed-use growth strategies would be encouraged to accommodate increases in population and travel demand.

Other than the mobile source emissions, the other emissions (residential and commercial building energy, water energy and construction) analysis presents gross estimates based on simplified assumptions for purposes of this programmatic analysis. The analysis is presented for purposes of internal comparison, and not for purposes of assessing whether overall the AB 32 GHG reduction target is met. As noted above, a number of sources of emission are not included in this analysis because the Plan would not have the ability to significantly change those emissions (industrial process emissions, planes, trains and ship emissions).

Table 3.6-3 shows GHG emissions by county for the GHG baseline (2005), existing (2011), and Plan and No Plan conditions in 2020 and 2035. Baseline (2005) emissions are estimated to be 142 million metric tons (MMT) of CO_2e compared to an estimated 144 MMT of CO_2e under existing (2011) conditions. It is estimated (based on simplified gross estimates of construction, energy use and water use) that in 2035 total (for the sources analyzed) emissions under the Plan would be more than existing and 2005 baseline conditions. Implementation of Mitigation Measures **MM-GHG1** through **MM-GHG12** would reduce total GHG emission impacts; however, impacts would remain significant.

TABLE 3.6-3: GREENHOUSE GAS EMISSIONS BY COUNTY

Area and Source	CO_2e Emissions (Million Metric Tons per Year)					
	Baseline (2005)	Existing (2011)	Future No Project (2020)	Plan (2020)	Future No Project (2035)	Plan (2035)
IMPERIAL COUNTY						
Construction	0.01	0.01	0.01	0.01	0.01	0.01
Transportation	1.3	1.3	1.7	1.7	2.4	2.4
Building Energy	0.40	0.49	0.56	0.41	0.62	0.39
Water-Related Energy	0.05	0.04	0.05	0.03	0.06	0.02
Subtotal	1.8	1.8	2.3	2.2	3.1	2.8
LOS ANGELES COUNTY						
Construction	0.17	0.16	0.16	0.16	0.15	0.15
Transportation	43	40	43	41	48	44
Building Energy	25	23	23	23	22	21
Water-Related Energy	2.0	2.5	2.1	2.2	1.9	1.9
Subtotal	70	66	68	66	72	67
ORANGE COUNTY						
Construction	0.04	0.04	0.04	0.04	0.04	0.04
Transportation	13	13	14	13	15	14
Building Energy	7.3	7.1	6.2	6.0	5.9	5.6
Water-Related Energy	0.63	0.76	0.62	0.64	0.57	0.59
Subtotal	21	21	21	20	22	20
RIVERSIDE COUNTY						
Construction	0.13	0.11	0.11	0.11	0.11	0.11
Transportation	11	12	14	14	19	18
Building Energy	4.8	5.4	5.5	4.8	6.5	4.9
Water-Related Energy	0.51	0.53	0.48	0.42	0.57	0.38
Subtotal	16	18	20	19	26	23
SAN BERNARDINO COUNTY						
Construction	0.07	0.07	0.07	0.07	0.07	0.07
Transportation	12	12	14	13	19	17
Building Energy	4.9	5.1	4.9	4.4	5.4	4.3
Water-Related Energy	0.45	0.48	0.41	0.38	0.48	0.34
Subtotal	17	18	19	18	25	22
VENTURA COUNTY						
Construction	0.01	0.01	0.01	0.01	0.01	0.01
Transportation	3.3	3.6	3.7	3.7	4.1	3.9
Building Energy	2.1	2.1	2.0	1.9	2.0	1.8
Water-Related Energy	0.18	0.21	0.17	0.17	0.17	0.09
Subtotal	5.6	5.9	5.9	5.8	6.3	5.8
Total Emissions	**132**	**130**	**137**	**131**	**154**	**141**
Plan (2020) Compared to Existing (2011)						**1**
Plan (2035) Compared to Existing (2011)						**11**
Future No Project (2020) Compared to Existing (2011)						**7**
Future No Project (2035) Compared to Existing (2011)						**24**

Note: The estimation of GHG emissions does not include the following sources: solid waste, aircraft, watercraft, trains, and industrial process sources. Total emissions resulting from construction, energy and water use are gross estimates based on simplified assumptions for purposes of this programmatic analysis.
SOURCE: TAHA, 2011; SCAG Transportation Modeling, 2011; Calthorpe, 2011.

Impact 3.6-2: Regarding the AB 32 GHG emission reduction targets (based on mobile sources and residential and commercial building energy use) the Plan would meet the applicable AB 32 reduction targets (identified in SB 375) with respect to light duty vehicles. However, without technical details as to how each sector of the economy will comply with AB 32, growth anticipated to occur under the Plan could result in a significant impact related to AB 32 and the Scoping Plan.

The Plan alone is not intended to meet the AB 32 target. By meeting the SB 375 targets (see Impact 3.6-3 below), the Plan has successfully contributed its share, if not greater, to meeting the AB 32 target.

This impact analysis estimates whether the emissions from the residential and commercial building energy consumption combined with mobile source emissions anticipated to occur under the Plan would be at or below 1990 levels as required by AB 32. The following analysis is extremely conservative because it assumes that the AB 32 implementation measures in the Scoping Plan will not be undertaken (except for the measures associated with SB 375, i.e., the SCS). Moreover, because future demand for energy and water are unknown and SCAG has no control over these emission factors, conservative assumptions have been applied.

As indicated by CEQA Appendix G, a significant GHG impact is identified if the Plan could conflict with applicable GHG reduction plans, policies, or regulations. AB 32 calls for GHG emissions to be reduced to 1990 levels by 2020. ARB's Scoping Plan functions as a roadmap to achieve AB 32 GHG reductions. The Scoping Plan contains the main strategies California will implement to reduce CO_2e emissions by 169 MMT, or 28.4 percent below the State's projected 2020 emissions level of 596 MMT CO_2e under a business-as-usual (BAU) scenario. In the absence of reliable 1990 GHG emissions estimates, ARB recommends an equivalent metric of 15 percent below 2005 GHG emissions. The following programmatic analysis prepared for this PEIR estimates emissions from 1) residential and commercial building construction and energy consumption (including energy needed to transport water); and 2) transportation activities (for all mobile sources, not just light duty vehicles) for 2005 to be 48.3 and 83.6 MMT CO_2e, respectively.

Because the Scoping Plan time horizon is limited to 2020, analysis of the Scoping Plan is presented for the year 2020 only, not for 2035 or 2050. The Governor's Executive Order EO-S-3-05 sets a goal that Statewide GHG emissions be reduced to 80 percent below 1990 levels by 2050. It is anticipated that a number of business and industry sectors, including energy and water providers, will be involved in meeting these targets through aggressive conservation and through emission reductions associated with their operations. However, this PEIR is not able to identify reasonably foreseeable new demand rates or emission factors based on available information.

Residential and Commercial Buildings; GHG Emissions Associated with Construction and Energy Demand

By 2020, population within the region is expected to increase by approximately 1,137,000 people and housing by approximately 486,000 units. The expected increase in population by 2020 would lead to a need for additional housing units and commercial development (as well as other GHG sources such as industrial processes, ship activity in the region, agricultural activity as well as planes and trains).

AB 32 legislation requires that the State achieve 1990-level emissions by 2020, or an equivalent of 15 percent reductions from 2005 levels by 2020. Based on the above-described estimation of GHG emissions, SCAG residential and commercial construction and operational energy emissions were estimated to be 48.3 MMT CO_2e in 2005. A 15- percent reduction would require 2020 emissions to be 41.1 MMT CO_2e. Estimated emissions for the SCAG region (from construction and commercial and residential energy demand) are predicted to be 44.4 MMT CO_2e in 2020.

As further discussed below, the Plan encourages compact development. In particular the Plan emphasizes a mix of housing types that substantially increases the development of apartments, condominiums and townhomes, and small lot single-family, relative to large lot single-family. Because of this smaller overall development footprint, the Plan will have reduced per household emissions. However, without further

conservation and reduced emission factors (anticipated to result from implementation strategies included in the AB 32 Scoping Plan), the substantial overall growth in population and development may result in higher , total emissions(see **Table 3.2-3**).

Transportation Network Improvements

The 2012-2035 RTP/SCS focuses transportation network improvements on transit, systems management, and demand management, lowering the need to drive alone and making roadways more efficient in order to reduce GHG emissions. The Scoping Plan explicitly establishes the responsibility for regional transportation planning's share of emissions reductions needed to meet AB 32 goals by referencing the SB 375 GHG emissions reduction targets. As discussed in Impact 3.2-3 below, the Plan meets the SB 375 targets.

Nevertheless, SCAG estimates 83.6 MMT CO_2e in transportation-related GHG emissions (all sources not just light duty vehicles) in 2005. A 15-percent reduction would require 2020 emissions to be 71.1 MMT CO_2e. Calculated GHG emissions (using EMFAC2007 and the SCAG Transportation Demand Model) in 2020 would be 86.4 MMT CO_2e. This represents an increase over 2005 conditions. However, as discussed above, this analysis assumes that the strategies included in the AB 32 Scoping plan are not implemented (except for the strategies contained in the SCS). For example, pursuant to AB 32, state measures have been adopted that will lower the carbon intensity of fuels and increase the efficiency of passenger vehicles (Pavley). These State measures have not been accounted for in this analysis because the precise fuel and vehicle fleet associated with their full implementation is not known at this time. If all the strategies in the AB 32 Scoping Plan (including Pavely) are implemented, SCAG would expect the GHG emissions to meet the AB 32 target, including the transportation related emissions.

Total GHG Emissions from Commercial and Residential Construction and Energy Demand and Mobile Sources in the 2012/2035 RTP/SCS

As shown in **Table 3.6-4**, GHG emissions from commercial and residential energy use, building construction and mobile sources in 2020 are expected to be greater than the GHG emissions target set by AB 32. The total residential, commercial and transportation emissions expected under the Plan in 2020 would be 130.8 MMT CO_2e. According to AB 32, emissions in 2020 must be equal to 1990 levels, or 15 percent below 2005 levels. Based on the estimates presented above, this would require emissions to be no greater than 111.2 MMT CO_2e in 2020. The calculated emissions (based on demand and emission factors that do not take into account the implementation strategies in the AB 32 Scoping Plan except for strategies in the SCS) are greater than 111.2 MMT CO_2e. Therefore, implementation of the Plan (including all emissions factors) could still yield an overall increase in GHG emissions compared to 2005 levels if the AB 32 Scoping Plan is not fully implemented by all the required sectors. However, as mentioned above and discussed in more detail below, where SCAG has SB 375-related responsibilities, the Plan meets the SB 375 targets. Implementation of Mitigation Measures **MM-GHG1** through **MM-GHG12** would reduce the impact related to AB 32; however, impacts would remain potentially significant because of the lack of definition in how AB 32 targets will be achieved by all the applicable sectors of the economy.

TABLE 3.6-4: GREENHOUSE GAS AB 32 ANALYSIS BY COUNTY

Scenario	CO_2e Emissions (% change)
Plan vs. 2005 Baseline Change in Emissions (AB 32 Target is 15% below 2005 levels by 2020)	1%
No Project vs. 2005 Baseline Change in Emissions (AB 32 Target is 15% below 2005 levels by (2020)	3%

Note: The estimation of GHG emissions does not include the following sources: solid waste, waterborne navigations, trains, aviation, agricultural uses, ozone depleting substances commercially produced (e.g., hydrofluorocarbons), and industrial processes.
SOURCE: TAHA, 2011; SCAG Transportation Modeling, 2011; Calthorpe, 2011.

The Scoping Plan sets out emission reduction requirements by sector that would achieve the goals of AB 32 when fully implemented. As of this writing, many of the policies in the Scoping Plan have not been fully implemented and, therefore, are not quantified in the GHG estimates presented above. Also as noted above, the analysis presented here relies on gross assumptions for construction and residential and commercial land uses and average energy and water consumption factors to present a simplified programmatic analysis of land use emissions. In addition, the analysis does not include a number of sources of emissions including solid waste, waterborne navigations, trains, aviation, agricultural uses, ozone depleting substances commercially produced (e.g., hydrofluorocarbons), and industrial processes.

SGAG fulfills its direct responsibilities for the State's overall GHG reduction goals through the SCS. The SCS combines the transportation projects and strategies from the overall Plan with improved land use, development and other policies. The result of the SCS package of strategies is a more efficient pairing of land use and transportation that reduces trips, increases transit usage, and promotes non-motorized modes. As noted in below under Impact 3.6-3, the SCS meets the GHG reduction targets for both 2020 and exceeds the target for 2035 established by ARB.

Conclusion

As stated above, the Plan alone is not intended to meet the AB 32 target. By meeting the SB 375 targets, the Plan has successfully contributed its share of meeting the objectives of AB 32. However, given the unknowns associated with the other required sectors, such as the demand for water and energy, and the projected population growth in the region, estimated total emissions could result in a significant impact without assuming that the strategies in the AB 32 Scoping Plan are implemented.

Impact 3.6-3: Per capita CO_2 emissions from light duty trucks and autos would meet the ARB 8 percent less than 2005 in 2020 target and would achieve even greater emission reductions in 2035 as compared to the 13 percent less than 2035 target (the region would achieve 16 percent per capita emission reductions in 2035). Therefore, the Plan would result in a less-than-significant impact related to per capita emissions and SB 375.

As described in the Regulatory Framework above, SB 375 requires ARB to develop regional CO_2 emission reduction targets, compared to 2005 emissions, *for cars and light trucks only* for 2020 and 2035 for each of the State's MPOs. Each MPO is to prepare an SCS as part of the RTP in order to reduce CO_2 by better aligning transportation, land use, and housing. For SCAG, the targets are to reduce per capita emissions 8 percent below 2005 levels by 2020 and 13 percent below 2005 levels by 2035. Determining the per capita CO_2 emissions requires modeling VMT by passenger vehicles and light trucks that emit CO_2 and dividing that number by the total population. SCAG estimates the per capita 2005 emissions from cars and light-duty trucks as 23.9 pounds CO_2 per person per day.[20]

2020

CO_2 emissions reductions achieved through SCS land use strategies are incorporated into the analysis of the transportation network improvement emissions reductions. The Plan includes proposed transportation improvements and land use changes that would lead to reduced congestion and increased transit options. State measures will be in place that would augment the reductions achieved by the Plan through reduced carbon intensity of fuels and increased fuel efficiency in passenger vehicles. As shown in **Table 3.6-5**, per capita CO_2 emissions from cars and light trucks (only) are calculated to be 21.9 pounds per day in 2020.[21] The result of the Plan is an 8 percent decrease in per capita CO_2 emissions from 2020 to 2005. The percent decrease would achieve the 8 percent emissions reduction target for the region. Therefore, the Plan would result in a less-than-significant impact related to per capita emissions and SB 375.

[20]The per capita emissions estimation for existing conditions is based on a resident population of 17,164,041, which does not include group quarters such as prisons, long-term hospitals, and university dormitories.

[21]The per capita emissions estimation for 2020 is based on a resident population of 19,349,757.

2035

As shown in **Table 3.6-5**, per capita CO_2 emissions *from cars and light trucks only* would be 20.5 pounds per day in 2035.[22] The result of the Plan is a 16 percent decrease in per capita CO_2 emissions from 2035 to 2005. The percent decrease would more than satisfy the 13 percent SCAG emissions reduction target.

TABLE 3.6-5: SB 375 ANALYSIS

County	Baseline (2005)	Future No Project (2020)	Plan (2020)	Future No Project (2035)	Plan (2035)
Resident Population (per 1,000)	17,161	19,344	19,346	21,769	21,773
CO_2 Emissions (per 1,000 Tons)	204.7	220.6	211.4	249.2	222.9
Per Capita Emissions (Pounds)	23.9	22.8	21.9	22.9	20.5
Percent Difference from Plan (2020) to Baseline (2005)					(8)
Percent Difference from Plan (2035) to Baseline (2005)					(14%)
(Additional Reductions from 4D Model)					(2%)
Total Reductions					(16%)
Percent Difference from Future No Project (2020) to Baseline (2005)					(4%)
Percent Difference from Future No Project (2035) to Baseline (2005)					(4%)

/a/ Population estimates exclude the group quarter population (e.g., dorms, prisons, long term hospitals).
/b/ Emissions are from passenger vehicles and light-duty trucks from Regional Travel Demand Model and EMFAC2007.
/c/ For description of 4D Model, see SCAG NHTS Model Documentation Report
SOURCE: SCAG Transportation Modeling, 2011.

Summary

The Plan would meet ARB per capita emission targets (more than meet in 2035) set pursuant to SB 375; therefore, this impact would be less-than-significant.

MITIGATION MEASURES

The following SCAG mitigation measures would also reduce GHGs:

Air Quality: MM-AQ1 (TCMs).

Transportation: MM-TR3 (sustainability workshop); MM-TR15 (congestion pricing); MM-TR16 (land use and TDM); MM-TR17 (TDM, telework); MM-TR19 (TDM, rideshare); MM-TR20 (TDM, vanpool); MM-TR21 (Planning, transit).

Land Use: MM-LU3 (consistency of transportation projects and growth), MM-LU4 (work with cities on updating General Plans and encouraging consistency), MM-LU5 (implementation of RTP/SCS), MM-LU6 (local technical assistance), MM-LU7 (marketing of Compass Blueprint principles), MM-LU8 (project consistency with RTP and other regional planning efforts).

[22]The per capita emissions estimation for 2035 is based on a resident population of 21,778,469.

The following mitigation measures to be implemented by local jurisdictions, project sponsors and others would reduce GHG emissions:

Air Quality: MM-AQ2 (PM 2.5 and Ozone attainment, fuel and engine technology); MM-AQ13 (electric power for construction activities); MM-AQ14 (landscaping/xeriscaping); MM-AQ15 (commercial vehicle idling); MM-AQ19 (use of ARB land use handbook).

Transportation: MM-TR24 (ride share); MM-TR25 (car sharing); MM-TR28 (TDM); MM-TR30 (transit quality); MM-TR31 (active transportation); MM-TR32 (bicycle infrastructure); MM-TR35 (parking); MM-TR36 (transit stops); MM-TR37 (transit incentives); MM-TR38 (least polluting modes); MM-TR39 (bicycle lanes); MM-TR40 (active transportation amenities); MM-TR41 (active transportation); MM-TR42 (active transportation routes, open space); MM-TR43 (active transportation, schools); MM-TR44 (active transportation, schools); MM-TR45 (alternative modes); MM-TR46 (public education); MM-TR47 (zero emissions vehicles); MM-TR48 (light vehicles, NEVs); MM-TR49 (idling time); MM-TR50 (low emission vehicles); MM-TR51 (alternative fuels, transportation technologies); MM-TR52 (public transit, development standards); MM-TR53 (public transit prioritization); MM-TR54 (pedestrian access); MM-TR56 (interconnectivity); MM-TR57 (transit maintenance); MM-TR58 (transit customer service); MM-TR59 (transit funding); MM-TR60 (transit, impact fees); MM-TR61 (roadway management); MM-TR63 (arterial management); MM-TR65 (HOV); MM-TR67 (trip reduction programs); MM-TR68 (ride share programs); MM-TR69 (employer trip reduction); MM-TR70 (ride home program); MM-TR71 (local area shuttle); MM-TR72 (low cost shuttles); MM-TR73 (shuttle coordination); MM-TR74 (low travel employment); MM-TR75 (bicycle infrastructure); MM-TR76 (bicycle standards); MM-TR77 (bicycle facilities); MM-TR78 (bike/ped trails); MM-TR79 (bicycle safety programs); MM-TR80 (bicycle and pedestrian project funding); MM-TR81 (bicycle parking); MM-TR82 (private vehicle cost); MM-TR83 (parking policy); MM-TR84 (event parking); MM-TR85 (parking cash out); MM-TR86 (EV/alt fuel parking); MM-TR87 (EV/alt fuel promotion); MM-TR88 (EV infrastructure); MM-TR89 (idling); MM-TR90 (active transportation); MM-TR91 (GHG reduction workshops); MM-TR92 (fleet replacement); MM-TR93 (municipal travel); MM-TR94 (trip reduction programs); MM-TR95 (bicycle programs); MM-TR96 (municipal parking management); MM-TR97 (carbon offsets); MM-TR98 (municipal facilities transit access).

Land Use: MM-LU12 (access to community facilities); MM-LU13 (active transportation facilities); MM-LU16 (TDR); MM-LU17 (open space, trees); MM-LU25 (resource efficient development); MM-LU26 (infill); MM-LU27 (mixed use); MM-LU41 (prioritizing use of existing infrastructure); MM-LU42 (urban growth boundary); MM-LU43 (public facilities); MM-LU44 (public facilities); MM-LU45 (growth to existing urban areas); MM-LU46 (density); MM-LU47 (density, mixed use); MM-LU48 (density, transit); MM-LU49 (density, accessory units); MM-LU50 (roadway widths); MM-LU51 (parking requirements); MM-LU52 (bicycle facilities); MM-LU53 (infill, density, mixed-use); MM-LU54 (mixed use); MM-LU55 (mixed use); MM-LU56 (mixed use); MM-LU57 (complete communities); MM-LU58 (jobs/housing); MM-LU59 (local business); MM-LU60 (form based codes); MM-LU62 (smart growth); MM-LU63 (smart growth principles); MM-LU64 (smart growth benchmarks); MM-LU66 (public transit): MM-LU67 (bicycle facilities); MM-LU68 (TOD); MM-LU69 (land use/transit): MM-LU71 (corridors); MM-LU72 (design standards, mixed use); MM-LU73 (TOD, affordability); MM-LU74 (jobs/housing balance); MM-LU77 (active transportation); MM-LU78 (neighborhood character, walkability); MM-LU79 (accessibility); MM-LU80 (fee structures); MM-LU83 (fee structures); MM-LU82 (permitting incentives); MM-LU83 (incentive funding); MM-LU84 (infrastructure incentives); MM-LU85 (pavement reduction).

Mitigation Measures **MM-GHG1** through **MM-GHG8** and **MM-GHG14** through **MM-GHG17** shall be implemented by SCAG over the lifetime of the 2012-2035 RTP/SCS. In addition, Mitigation Measures **MM-GHG9** through **MM-GHG17** can and should be implemented by SCAG project sponsors (for both development and transportation projects) as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions.

MM-GHG1: SCAG shall update any future Regional Transportation Plans/Sustainable Community Plans and Regional Comprehensive Plans to incorporate policies and measures that lead to reduced greenhouse gas (GHG) emissions. Such policies and measures may be derived from the General Plans, local jurisdictions' Climate Action Plans (CAPs), and other adopted policies and plans of its member agencies that include GHG mitigation and adaptation measures or other sources.

MM-GHG2: SCAG shall, through its on-going outreach and technical assistance programs, work with and encourage local governments to adopt policies and develop practices that lead to GHG emission reductions. These activities will include, but are not limited to, providing technical assistance and information sharing on developing local Climate Action Plans

MM-GHG3: SCAG shall work with the business community, including the Southern California Leadership Council and the Global Land Use and Environment Council, to develop regional economic strategies that promote energy savings and GHG emission reduction.

MM-GHG4: SCAG shall develop statewide strategies and approaches to reducing GHG emissions and implement SB 375 through its on-going coordination effort with other MPOs.

MM-GHG5: SCAG shall assist ARB and air districts in efforts to implement the AB 32 Scoping Plan.

MM-GHG6: SCAG shall develop a regional climate and economic development strategy that assesses the cost effectiveness of GHG reduction measures and prioritizes strategies that have greatest overall benefit to the economy.

MM-GHG7: SCAG, in its capacity as a Clean Cities Coalition, shall work with member local governments to promote the use of alternative fuel technology.

MM-GHG8: SCAG shall work with utilities, sub-regions, and other stakeholders to promote accelerated penetration of zero emission electric vehicles in the region, including developing a strategy for the deployment of public charging infrastructure

MM-GHG9: SCAG member cities and the county governments can and should adopt and implement Climate Actions Plans (CAPs, also known as Plans for the Reduction of Greenhouse Gas Emissions as described in CEQA Guidelines Section 15183.5 Tiering and Streamlining the Analysis of Greenhouse Gas Emissions) that contain the following information:

a) Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within their respective jurisdictions;
b) Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
c) Identify and analyze the GHG emissions resulting for specific actions or categories of actions anticipated within their respective jurisdictions;

d) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
e) Establish a mechanism to monitor the plan's progress toward achieving that level and to require amendment if the plan is not achieving specified levels; and
f) Be adopted in a public process following environmental review.

CAPs can and should, when appropriate, incorporate planning and land use measures from the California Attorney General's latest list of example policies to address climate change at both the plan and project level. Specifically, at the plan level, land use plans can and should, when appropriate, incorporate planning and land use measures from the California Attorney General's latest list of example policies to address climate change (http://ag.ca.gov/globalwarming/pdf/GP_policies.pdf), including, but not limited to policies from that web page such as:

- Smart growth, jobs/housing balance, transit-oriented development, and infill development through land use designations, incentives and fees, zoning, and public-private partnerships
- Create transit, bicycle, and pedestrian connections through planning, funding, development requirements, incentives and regional cooperation, and create disincentives for auto use
- Energy and water-efficient buildings and landscaping through ordinances, development fees, incentives, project timing, prioritization, and other implementing tools

In addition, member cities and the county governments can and should incorporate, as appropriate, policies to encourage implementation of the Attorney General's list of project specific mitigation measures available at the following web site: http://ag.ca.gov/globalwarming/pdf/ GW_mitigation_measures.pdf, including, but not limited to measures from the web page, such as:

- Adopt a comprehensive parking policy that discourages private vehicle use and encourages the use of alternative transportation
- Build or fund a major transit stop within or near development
- Provide public transit incentives such as free or low-cost monthly transit passes to employees, or free ride areas to residents and customers
- Incorporate bicycle lanes, routes and facilities into street systems, new subdivisions, and large developments
- Require amenities for non-motorized transportation, such as secure and convenient bicycle parking.

They should also incorporate, when appropriate, planning and land use measures from additional resources listed by the California Attorney General at the following webpage: http://ag.ca.gov/globalwarming/ceqa/resources.php.

In addition, CAPs can and should also incorporate analysis of climate change adaptation, in recognition of the likely and potential effects of climate change in the future regardless of the level of mitigation and in conjunction with Executive Order S-13-08, which seeks to enhance the State's management of climate impacts including sea level rise, increased temperatures, shifting precipitation, and extreme weather events by facilitating the development of State's first climate adaptation strategy.

MM-GHG10: Project sponsors can and should require Best Available Control Technology (BACT) during construction and operation of projects, including:

a) Solicit bids that include use of energy and fuel-efficient fleets;
b) Solicit preference construction bids that use BACT;
c) Employ use of alternative fueled vehicles;
d) Use lighting systems that are energy efficient, such as LED technology;
e) Use CEQA Guidelines Appendix F, Energy Conservation, to create an energy conservation plan;
f) Streamline permitting process to infill, redevelopment, and energy-efficient projects;
g) Use an adopted emissions calculator to estimate construction-related emissions;
h) Use the minimum feasible amount of GHG-emitting construction materials that is feasible;
i) Use of cement blended with the maximum feasible amount of flash or other materials that reduce GHG emissions from cement production;
j) Use of lighter-colored pavement where feasible;
k) Recycle construction debris to maximum extent feasible; and
l) Plant shade trees in or near construction projects where feasible.

MM-GH11: SCAG shall in its capacity as a Clean Cities Coalition, and local jurisdictions can and should establish a coordinated, creative public outreach campaign, including publicizing the importance of reducing GHG emissions and steps community members can take to reduce their individual impacts.

MM-GHG12: Pedestrian and Bicycle Promotion: SCAG shall and local jurisdictions can and should work with local community groups and downtown business associations to organize and publicize walking tours and bicycle events, and to encourage pedestrian and bicycle modes of transportation.

MM-GHG13: Waste Reduction: Local jurisdictions can and should organize workshops on waste reduction activities for the home or business, such as backyard composting, or office paper recycling, and will schedule recycling drop-off events and neighborhood chipping/mulching days.

MM-GHG14: Water Conservation: SCAG shall and local jurisdictions can and should organize workshops on water conservation activities, such as selecting and planting drought tolerant, native plants in landscaping, and installing advanced irrigation systems.

MM-GHG15: Energy Efficiency: SCAG shall and local jurisdictions can and should organize workshops on steps to increase energy efficiency in the home or business, such as weatherizing the home or building envelope, installing smart lighting systems, and how to conduct a self-audit for energy use and efficiency.

MM-GHG16: Climate Protection Summit/Fair: SCAG shall and local jurisdictions can and should organize an annual Climate Protection Summit or Fair, to educate the public on current climate science, projected local impacts, and local efforts and opportunities to reduce GHG emissions, including exhibits of the latest technology and products for conservation and efficiency.

MM-GHG17: Schools Programs: SCAG shall and local jurisdictions can and should develop and implement a program to present information to school children about climate change and ways to reduce GHG emissions, and will support school-based programs for GHG reduction, such as school based trip reduction and the importance of recycling.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Total GHG Emissions

Impacts related to total GHG emissions were determined to be significant even after mitigation as a result of a number of factors explained above. In addition the effectiveness of the mitigation measures identified above cannot be reasonably quantified at this time. Implementation of Mitigation Measures **MM-GHG1** through **MM-GHG17** would reduce GHG emissions through adoption of measures and policies that encourage GHG emissions reduction in regional plans, adoption of Climate Action Plans by member agencies, and using BACT during construction and operation of implemented projects.

AB 32 Analysis

Implementation of Mitigation Measures **MM-GHG1** through **MM-GHG17** would reduce GHG emissions through adoption of measures and policies that encourage GHG emissions reduction in regional plans, adoption of Climate Action Plans by member agencies, and using BACT during construction and operation of implemented projects.

The projected increase in GHG emissions from existing conditions to 2035 and beyond would primarily be due to changes in regional growth/land use. While the mitigation measures listed would encourage reduction in GHG emissions, they do not provide a mechanism that guarantees GHG emission reductions. Additional measures that were considered but found infeasible included the following:

- Requiring all vehicles driven within the SCAG region to be zero-emission vehicles (ZEVs) or requiring all vehicles driven within the region to be powered by renewable energy was found to be infeasible due to the rate of turnover of vehicles on the roadway and limited number of ZEVs available. ARB has estimated that 50 percent of passenger cars are retired from service in 16.09 years and 18.63 years for light-duty trucks. As of 2010, there were an estimated 26,905,700 vehicles in California, with only 1.7 million ZEVs or low-emission vehicles. Similarly, conversion of existing vehicles to renewable energy fuel sources would likely result in greater demand than supply of renewable energy fuels.

- Requiring all future construction be net-zero energy use. While renewable energy is available and a feasible option for obtaining a portion of a project's energy needs, it is infeasible for all projects to have net-zero emissions. For projects with consistent-energy requirements, such as hospitals or manufacturing centers, renewable energy may not fulfill operational standards. In addition, some energy-consuming services that are part of new projects may not be feasible to change to renewable sources at the project level. For example, water is transported from long distances and a project may not be able to affect the power source for water transport. Similarly, wastewater is generally treated at a central location and operated independently from a project. For each project to treat its own wastewater with renewable energy sources may cause other environmental impacts.

- Requiring all future construction activity to include only retrofitted equipment. Some construction equipment may be retrofitted to significantly reduce the GHG emissions associated with construction activities; however, not all equipment has retrofit components and is therefore technologically infeasible at this time.

Implementation of the Plan would result in an increase in GHG emissions as a result of the estimated mobile source emissions (other than light duty vehicles which would meet the applicable target – see SB 375 discussion) and construction and energy demand associated with residential and commercial buildings. Consequently, Impact 3.6-2 would remain a significant impact.

SB 375 Analysis

Impacts related to the SB 375 analysis were determined to be less than significant without mitigation.

COMPARISION WITH THE NO PROJECT ALTERNATIVE

Direct Impacts

The Plan focuses development in a compact pattern designed to increase the efficiency of the transportation system as well as the efficiencies of these land uses (as discussed above more dense development consumes less energy and less water per capita). Without changes to land use patterns, regional GHG emissions would increase and SCAG would not meet SB 375 CO_2 reduction goals. **Table 3.6-3** shows that total regional GHG emissions under the No Project Alternative would increase in 2020 and 2035 as compared to the Plan condition. **Table 3.6-4** shows that, as with the Plan the No Project Alternative would not meet the AB 32-related 15 percent reduction in GHG emissions from 2005 levels by 2020, however emissions under the No Project Alternative would be greater than under the Plan. **Table 3.6-4** shows that regional per capita GHG emissions would increase under the No Project Alternative. As a result, the No Project Alternative would not achieve the SB 375 emissions targets (as compared to the Plan which would meet the targets). **Based on this analysis, the Plan impacts would be less than the No Project Alternative impacts for Impacts 3.6-1 and 3.6-2.**

The Plan includes transportation and land use strategies that focus growth along existing corridors and in urbanized areas, rather than development of vacant, open space/recreation and agricultural lands. This compact development pattern included in the Plan would concentrate population in urban areas and encourage alternative modes of travel other than automobiles. As a result of this growth pattern, it is anticipated that the Plan would generate less regional VMT when compared to the No Project Alternative. In addition, various components of the Plan (e.g., increased density and energy efficiency measures) ensure that the Plan would use less energy and water than the No Project Alternative. When compared to the Plan, the No Project Alternative would result in more total GHG emissions and would push the region further from achieving the AB 32 reduction goals (Impacts 3.6-2). In addition, the No Project Alternative would reduce per capita car and light truck emissions by only approximately four percent in both 2020 and 2035 compared to 2005. This reduction would not meet ARB per capita emission targets of 8 percent in 2020 and 13 percent in 2035 (Impact 3.6-3). **The Plan impacts would be less than significant while the No Project Alternative impacts for GHG emissions would be significant.**

Cumulative Impacts

The Plan meets SB 375 targets for reducing greenhouse gas emissions and contributes to reductions in statewide emissions required under AB 32. The No Project Alternative would not achieve these targets or emission reductions. **As noted above, the Plan impacts would be less than significant while No Project Alternative impacts would be significant.**

3.7 HAZARDOUS MATERIALS

This section describes the current hazardous materials system in the SCAG region, discusses the potential impacts of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategies (2012-2035 RTP/SCS or Plan) on hazards and hazardous materials, identifies mitigation measures for the impacts and evaluates the residual impacts. Contamination of water resources is addressed in Section 3.13 Water Resources.

REGULATORY FRAMEWORK

Hazardous materials and wastes are defined and regulated in the United States by federal, state, and local regulations, including those administered by the U.S. Environmental Protection Agency (USEPA), the California Environmental Protection Agency (Cal/EPA), the U.S. Occupational Safety and Health Administration, the U.S. Department of Transportation (USDOT), the U.S. Nuclear Regulatory Commission, and various other agencies. The following discussion provides an overview of relevant federal and state legislation and the respective implementing authorities.

Federal

Resource Conservation and Recovery Act (RCRA). RCRA gives the USEPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste by "large-quantity generators" (1,000 kilograms/month or more). Under RCRA regulations, hazardous wastes must be tracked from the time of generation to the point of disposal. At a minimum, each generator of hazardous waste must register and obtain a hazardous waste activity identification number. If hazardous wastes are stored for more than 90 days or treated or disposed at a facility, any treatment, storage, or disposal unit must be permitted under RCRA. Additionally, all hazardous waste transporters are required to be permitted and must have an identification number. RCRA allows individual states to develop their own program for the regulation of hazardous waste as long as it is at least as stringent as RCRA. In California, the USEPA has delegated RCRA enforcement to the State of California.

Occupational Safety and Health Act of 1970. The Occupational Safety and Health Act, which is implemented by the Federal Occupational Safety and Health Administration (OSHA), contains provisions with respect to hazardous materials handling. Federal OSHA requirements, as set forth in Title 29 of the Code of Federal Regulations (CFR) Section 1910, et. seq., are designed to promote worker safety, worker training, and a worker's right–to-know. In California, OSHA has delegated the authority to administer OSHA regulations to the State of California.

Title 49 of the CFR, which contains the regulations set forth by the Hazardous Materials Transportation Act of 1975, specifies additional requirements and regulations with respect to the transport of hazardous materials. Title 49 of the CFR requires that every employee who transports hazardous materials receive training to recognize and identify hazardous materials and become familiar with hazardous materials requirements. Drivers are also required to be trained in operations of their equipment and commodity specific requirements.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLA (generally referred to as Superfund) was enacted by Congress on December 11, 1980. CERCLA provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA establishes requirements concerning closed and abandoned hazardous waste sites; provides for liability of persons responsible for releases of hazardous

waste at these sites; and establishes a trust fund to provide for cleanup when no responsible party can be identified. CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the NPL sites, which is the list of hazardous waste sites eligible for long-term remedial action financed under the federal Superfund program. CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) on October 17, 1986.

Superfund Amendments and Reauthorization Act (SARA). SARA of 1986 reauthorized CERCLA to continue cleanup activities around the country. Several site-specific amendments, definitions, clarifications, and technical requirements were added to the legislation, including additional enforcement authorities.

State

Authority for the statewide administration and enforcement of RCRA rests with the California EPA's (Cal/EPA) Department of Toxic Substances Control (DTSC). While the DTSC has primary State responsibility in regulating the generation, storage and disposal of hazardous materials, DTSC may further delegate enforcement authority to local jurisdictions. In addition, the DTSC is responsible and/or provides oversight for contamination cleanup, and administers state-wide hazardous waste reduction programs. DTSC operates programs to accomplish the following: (1) deal with the aftermath of improper hazardous waste management by overseeing site cleanups; (2) prevent releases of hazardous waste by ensuring that those who generate, handle, transport, store, and dispose of wastes do so properly; and (3) evaluate soil, water, and air samples taken at sites.

The storage of hazardous materials in Underground Storage Tanks (USTs) is regulated by Cal/EPA's State Water Resources Control Board (SWRCB), which has delegated authority to the Regional Water Quality Control Board (RWQCB) and, typically at the local level, to the local fire department.

The California OSHA (Cal-OSHA) program is administered and enforced by the Division of Occupational Safety and Health (DOSH). Cal-OSHA is very similar to the federal OSHA program. For example, both programs contain rules and procedures related to exposure to hazardous materials during demolition and construction activities. In addition, Cal-OSHA requires employers to implement a comprehensive, written Injury and Illness Prevention Program (IIPP). This program identifies policies and procedures designed to provide a safe work environment.

Hazardous Waste Control Act. The Hazardous Waste Control Act created the State hazardous waste management program, which is similar to but more stringent than the federal Resource Conservation and Recovery Act program. The act is implemented by regulations contained in Title 26 of the CCR, which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling, treatment, storage, and disposal facilities; treatment standards; operation of facilities and staff training; and closure of facilities and liability requirements. These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with DTSC.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program. The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) required the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, a Certified Unified Program Agency (CUPA). The Program Elements consolidated under the Unified Program are: Hazardous Waste Generator and On-site Hazardous Waste Treatment Programs (a.k.a. Tiered Permitting); Aboveground Petroleum Storage Tank Spill Prevention Control and Countermeasure Plan (SPCC); Hazardous Materials Release Response Plans and Inventory Program (a.k.a. Hazardous Materials

Disclosure or "Community-Right-To-Know"); California Accidental Release Prevention Program (Cal ARP); Underground Storage Tank (UST) Program; and Uniform Fire Code Plans and Inventory Requirements. The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. The Unified Program is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. Some CUPAs have contractual agreements with another local agency, a participating agency, which implements one or more Program Elements in coordination with the CUPA.

Hazardous Materials Release Response Plans and Inventory Act of 1985. The Hazardous Materials Release Response Plans and Inventory Act, also known as the Business Plan Act, requires businesses using hazardous materials to prepare a plan that describes their facilities, inventories, emergency response plans, and training programs. Hazardous materials are defined as unsafe raw or unused materials that are part of a process or manufacturing step. They are not considered hazardous waste. Health concerns pertaining to the release of hazardous materials, however, are similar to those relating to hazardous waste.

Hazardous Waste Source Reduction and Management Review Act of 1989. This Act requires generators of 12,000 kilograms/year of typical/operational hazardous waste to conduct an evaluation of their waste streams every four years and to select and implement viable source reduction alternatives. This Act does not apply to non-typical hazardous waste (such as asbestos and polychlorinated biphenyls).

California Vehicle Code. The California Vehicle Code (Title 13 of the CCR) establishes regulations for motor carrier transport of hazardous materials. For example, all motor carrier transporters of hazardous materials are required to have a Hazardous Materials Transportation license issued by the California Highway Patrol. In addition, placards identifying that hazardous materials are being transported must be displayed on the vehicle.

California Health and Safety Code. The transport of hazardous waste materials is further governed by the California Health and Safety Code Section 25163 and Title 22, Chapter 13, of the CCR. Specifically, Section 25163 of the California Health and Safety Code requires transporters of hazardous waste to hold a valid registration issued by the DTSC in his/her possession while transporting hazardous waste. Additionally, Title 22, Chapter 13 of the CCR includes a number of requirements, which include, but are not limited to, the following:

- Transporters shall not transport hazardous waste without first receiving an identification number and a registration certificate from DTSC;
- Registration as a hazardous waste transporter expires annually, on the last day of the month in which the registration was issued;
- To be registered as a hazardous waste transporter, an application must be submitted;
- Hazardous waste shall not be accepted for transport without a Uniform Hazardous Waste Manifest that has been properly completed and signed by generator and transporter; and
- Hazardous waste shall be delivered to authorized facilities only.

Local Regulations

Fire Departments and other agencies in the SCAG region have a variety of local laws that regulate reporting, storage and handling of hazardous materials and wastes.

EXISTING SETTING

This section discusses the existing conditions related to hazardous materials in the SCAG region, which includes an overview of the presence of hazardous materials and the potential for impacts to occur as a result of the Plan including increased transportation of hazardous materials as a result of increased transportation facilities and increased use of hazardous materials and generation of wastes as a result of increased development including industrial and other uses.

Definitions

The term "hazardous material" can have varying definitions depending on the regulatory programs. For the purposes of this PEIR, the term "hazardous materials" refers to both hazardous materials and hazardous wastes. The California Health and Safety Code Section 25501(p) defines hazardous material as follows:[1]

> "Hazardous material means any material that because of its quantity, concentrations, 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 which a handler or the administering agency has a reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment."

Following is a description of several types of substances and materials. A "hazardous waste" is defined as one which exhibits one or more of the characteristics identified below:[2]

Toxic Substances. Toxic substances may cause short-term or long-lasting health effects, ranging from temporary effects to permanent disability, or even death. For example, such substances can cause disorientation, acute allergic reactions, asphyxiation, skin irritation, or other adverse health effects if human exposure exceeds certain levels. The level depends on the substances involved and is chemical-specific. Carcinogens (substances that can cause cancer) are a special class of toxic substances. Examples of toxic substances include benzene (a component of gasoline and a suspected carcinogen) and methylene chloride (a common laboratory solvent and a suspected carcinogen).

Ignitable Substances. Ignitable substances are hazardous because of their ability to burn. Gasoline, hexane, and natural gas are examples of ignitable substances.

Corrosive Materials. Corrosive materials can cause severe burns. Corrosives include strong acids and bases such as sodium hydroxide (lye) or sulfuric acid (battery acid).

Reactive Materials. Reactive materials may cause explosions or generate toxic gases. Explosives, pure sodium or potassium metals (which react violently with water), and cyanides are examples of reactive materials.

Hazardous Materials

Soil and groundwater can become contaminated by hazardous material releases in a variety of ways, including permitted or illicit use and accidental or intentional disposal or spillage. Before the 1980s, most land disposal of chemicals was unregulated, resulting in numerous industrial properties and public landfills

[1]Title 22 CCR., Section 66261.3, "Hazardous Waste".
[2]Title 22 CCR., Section 66261.20-66261.24, "Hazardous Waste".

becoming dumping grounds for unwanted chemicals. In general, the largest and most contaminated of these sites became federal Superfund sites in the early 1980s, so named for their eligibility to receive cleanup money from a federal fund established for that purpose under CERCLA. Sites are added to the NPL following a hazard ranking system. The USEPA maintains this list of federal Superfund sites, as well as a more extensive list of all sites with potential to be listed known as Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS).

Numerous smaller properties also have been designated as contaminated sites. Often, these are gas station sites, where leaking underground storage tanks were upgraded under a federal requirement in the late 1980s. Another category of sites, which may have some overlap with the types already mentioned, is brownfields sites. Brownfields sites are those areas that were previously used for industrial purposes or certain commercial uses. The land may be contaminated by low concentrations of hazardous waste or pollution, and has the potential to be reused once it is cleaned up. Both the USEPA and DTSC maintain lists of known brownfield sites. These sites are often difficult to inventory due to their owners' reluctance to publicly label their property as potentially contaminated. In California, numerous regulatory barriers have blocked effective reuse of brownfields sites, including uncertainty as to cleanup levels and ultimate cleanup cost. State legislation (SB 32, Escutia) adopted in 2001 establishes a locally-based program to help speed the cleanup and reuse of brownfields sites.

Radioactive Materials

Although there are no nuclear power stations within the SCAG Region, the San Onofre Nuclear Generating Station is located just south of Orange County near San Clemente, in the northwestern corner of San Diego County. San Onofre Nuclear Generating Station is jointly owned by Southern California Edison (SCE), San Diego Gas & Electric, and the City of Riverside. The two operating units at the station began commercial operation in the early 1980s, and the operation license expires in 2022. SCE must then apply to the US Nuclear Regulatory Commission for a 20 year license extension.[3] The Santa Susana Sodium Reactor Experimental (SRE) was a small sodium-cooled experimental reactor built by SCE and Atomics International at the Santa Susana Field Laboratory, near Moorpark in Ventura County. The SRE began feeding electricity to the grid in 1957, and in 1959, suffered a partial core meltdown. Ten of 43 fuel assemblies were damaged due to lack of heat transfer and radioactive contamination was released. The SRE closed in 1964 and has subsequently been dismantled.[4]

Contaminated Sites

DTSC maintained a database, known as "CalSites," which contained information on properties in California where hazardous substances were released, or where the potential for a release existed. In 2006, DTSC launched its brownfields site database, EnviroStor, which provides similar information to CalSites, including identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites. **Table 3.7-1** shows the total number of sites listed in DTSC databases for the six counties that comprise the SCAG region.

[3] California Energy Commission, *Nuclear Energy in California, http://www.energy.ca.gov/nuclear/california.html*, accessed November 29, 2011.
[4] *Ibid.*

TABLE 3.7-1: NUMBER OF CLEANUP SITES BY COUNTY

County	Federal Superfund (NPL)	School Cleanup	State Response	Voluntary Cleanup	Total
Imperial	1	0	15	6	**22**
Los Angeles	21	135	160	237	**553**
Orange	3	12	23	23	**61**
Riverside	4	14	26	16	**60**
San Bernardino	5	17	39	22	**83**
Ventura	2	3	14	18	**37**

SOURCE: DTSC – EnviroStor website: *http://www.envirostor.dtsc.ca.gov/public/default.asp*, accessed May 2011.

Several California environmental agencies maintain lists of properties that are contaminated or are otherwise associated with the use of hazardous materials, including the following:

- Department of Toxic Substances Control:
  - HazNet list – data on hazardous waste shipments from Hazardous Waste Information System
  - Hazardous Waste and Substances Site List ("Cortese" list) – hazardous materials release locations

- California Integrated Waste Management Board (part of Cal/EPA)
  - Solid Waste Information System – data on open, closed and inactive solid waste disposal facilities and transfer stations

- State Water Resources Control Board (SWRCB; part of Cal/EPA)
  - Leaking Underground Storage Tank (LUST) list – data for specific parts of the state is also maintained by the RWQCB

- Cal/EPA
  - Annual Work Plan – indicates which sites are targeted for cleanup using state funds.

Underground Storage Tanks[5]

An underground storage tank (UST) system is a tank and any underground piping connected to the tank that has at least ten (10) percent of its combined volume underground. The federal UST regulations apply only to underground tanks and piping storing either petroleum or certain hazardous substances. When the UST program began, there were approximately 2.1 million regulated tanks in the United States. Today, there are far fewer regulated tanks, since many substandard UST systems have been closed. Nearly all USTs at these sites contain petroleum. These sites include marketers who sell gasoline to the public (such as service stations and convenience stores) and non-marketers who use tanks solely for their own needs (such as fleet service operators and local governments). USEPA estimates about 10,000 tanks hold hazardous substances covered by the UST regulations.

The greatest potential hazard from a LUST is that the petroleum or other hazardous substance can seep into the soil and contaminate groundwater, the source of drinking water for nearly half of all Americans (although not such a high percentage in the SCAG region). A LUST can present other health and environmental risks, including the potential for fire and explosion. Until the mid-1980s, most USTs were made of bare steel, which is likely to corrode over time and allow UST contents to leak into the environment. Faulty installation or inadequate operating and maintenance procedures also can cause USTs to release their contents into the environment. **Table 3.7-2** shows the number of USTs within the SCAG region.

[5]USEPA website. Last updated January 25, 2011. *Overview of Federal Underground Storage Tank Program, http://www.epa.gov/OUST/overview.htm*, accessed August 2011.

TABLE 3.7-2: UNDERGROUND STORAGE TANKS	
County	**Underground Storage Tank (UST)**
Imperial	217
Los Angeles	7,266
Orange	3,022
Riverside	1,351
San Bernardino	1,066
Ventura	1,399
SOURCE: Cal/EPA, State Water Resources Control Board website, *http://geotracker.waterboards.ca.gov/*, accessed May 2011.	

Hazardous Materials Transport. There are several risks associated with the transportation-related use of hazardous materials in the SCAG region. Actual transport of hazardous materials via truck, rail, and other modes involves a degree of risk of accident and release. The use of hazardous materials and the generation of hazardous waste in the construction and maintenance of the transportation system are other avenues for risk or exposure. Finally, the past disposal of hazardous materials in a manner that creates residual contamination of soil or water can be a source of risk when such sites are disturbed in the course of future transportation projects or associated development. Each of these avenues is discussed below.

Hazardous materials move through the SCAG region by a variety of modes: truck, rail, air, ship, and pipeline. According to the Office of Hazardous Materials Safety (OHMS) in the U.S. Department of Transportation (USDOT), hazardous materials shipments can be regarded as equivalent to deliveries, but any given shipment may involve one or more movements, or trip segments, that may occur by different modes. For instance, a shipment might involve initial pickup by truck (one movement), a transfer to rail (a second movement), and a final delivery by truck again (for a total of three movements). Each movement of hazardous materials implies a degree of risk, depending on the material being moved, the mode of transport, and numerous other factors.

According to the Commodity Flow Survey (CFS) data, there were approximately 2.3 billion tons of hazardous materials shipments in the United States in 2007. **Table 3.7-3** indicates that trucks move more than one-half of all hazardous materials shipped from a location in the United States. By contrast, rail accounts for only seven percent of shipments.[6]

TABLE 3.7-3: HAZARDOUS MATERIAL SHIPMENTS IN THE UNITED STATES			
Mode	**Total Commercial Freight Activity (thousand tons)**	**Hazardous Materials Shipped (thousand tons)**	**Percent of Hazardous Materials Shipped**
Truck	8,778,713	1,202,825	13.7%
Pipeline	650,859	628,905	96.6%
Rail	1,861,307	129,743	7%
Water	403,639	149,794	37.1%
SOURCE: USDOT, Bureau of Transportation Statistics. 2007 *Hazardous Materials Commodity Flow Survey*, July 2010; USDOT, Bureau of Transportation Statistics. 2007 *Commodity Flow Survey*, April 2010.			

Aside from rail, pipeline, and water shipments, hazardous materials transported through the SCAG region make use of many of the same freeways, arterials, and local streets as other traffic in the region. This creates a risk of accidents and associated release of hazardous materials for other drivers and for people along these routes, as does the use of rail modes for hazardous materials shipments. According to the USDOT, Hazardous Materials Information System, in 2010, highways accounted for the largest share of hazardous

[6]USDOT Bureau of Transportation Statistics. *Commodity Flow Survey*, 2010.

materials incidents, with a total of 12,635 incidents or 85 percent of total incidents. Air accounted for 9 percent of total hazardous materials incidents, followed by rail and water transport.[7]

THRESHOLDS OF SIGNIFICANCE

Based on CEQA Appendix G and as appropriate for the 2012-2035 RTP/SCS, the Plan would have a significant impact related to hazards and hazardous materials if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazards or hazardous materials;
- 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;
- Emit hazardous materials within one-quarter mile of a school;
- Disturb contaminated property during the construction of new transportation or expansion of existing transportation facilities, and/or
- Cause a cumulatively considerable hazard to the public or the environment outside the SCAG region (impacts inside the region are considered in the project analyses).

Methodology

As stated by the OHMS, the frequency and location of hazardous material shipments are an indicator of risk. Therefore, the impact of hazardous materials transportation through the SCAG region can be assessed by examining the 2012-2035 RTP/SCS's effect on hazardous materials shipments.

To assess potential hazards to sensitive receptors adjacent to transportation corridors, Geographic Information Systems (GIS) analysis was used to identify where 2012-2035 RTP/SCS major freeway, rail, and transit projects would be within 150 feet of 2035 residential land uses. In addition, a half-mile buffer (one-quarter mile on either side) was drawn around the freeway, rail, and transit projects to identify the number of existing schools potentially affected by transportation projects in the 2012-2035 RTP/SCS.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

[7] United States, State Department of Transportation Hazardous Materials Information System. *https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Dashboard&NQUser=HazmatWebsiteUser1&NQPassword=HazmatWebsiteUser1&PortalPath=/shared/Public%20Website%20Pages/_portal/10%20Year%20Incident%20Summary%20Reports*, accessed August 2011.

Comparison with the No Project Alternative

The analysis of hazardous materials also includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan were adopted. This evaluation is not included in the determination of the significance of impacts (which is based on comparison to existing conditions); however, it provides a meaningful perspective on the expected effects of the 2012-2035 RTP/SCS.

Determination of Significance

The methodology for determining the significance of hazardous material impacts compares the existing conditions to the future 2035 conditions under the Plan, as required in CEQA Section 15126.2(a).

Implementation of the 2012-2035 RTP/SCS would affect the transportation and handling of hazardous materials in the SCAG region by improving and increasing transportation routes in proximity to sensitive receptors such as schools and residential uses. The potential for risk related to hazardous materials was assessed by evaluating the locations of proposed projects in relation to the surrounding uses, as well as the potential expected significant impacts related to the risk of accidental releases due to an increase in the transportation of hazardous materials and the potential for such releases to reach schools, and communities adjacent to transportation facilities included in the 2012-2035 RTP/SCS.

The following discussion presents a programmatic regional evaluation of potential impacts of the 2012-2035 RTP/SCS projects on hazardous materials. As applicable (i.e., for transportation projects that would affect hazardous materials and development adjacent to facilities that carry hazardous materials), potential significant impacts must be evaluated on a project-by-project basis and appropriate mitigation measures identified as appropriate.

As specified in applicable Mitigation Monitoring and Reporting Plans, applicants or local jurisdictions or agencies shall be responsible for ensuring adherence to the applicable mitigation measures prior to construction. At a minimum, lead agencies for regionally significant projects, should provide to SCAG documentation of compliance with applicable mitigation measures through its Intergovernmental Review Process (IGR).

IMPACTS

Impact 3.7-1: Potential to create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

The 2012-2035 RTP/SCS includes projects (both transportation projects and development undertaken in accordance with the Plan) that may involve the transportation, use, and/or disposal of hazardous materials. In particular, the proposed freight rail enhancements and other goods movement capacity enhancements could result in increased or new transport of hazardous materials or wastes. In addition, construction and maintenance of these projects would result in use of equipment that contains or uses routine hazardous materials (e.g., diesel-fuel, paint and cleaning solutions), and the transportation of excavated soil and/or groundwater containing contaminants from previously contaminated areas.

Port traffic (and associated goods movement in the region) is anticipated to triple over the lifetime of the Plan. Container traffic is anticipated to increase from approximately 14 million 20-foot Equivalent Units (TEUs) in 2010 to a projected approximately 43 million TEUs in 2035. The fraction of containers that include hazardous materials is not known, but if we assume that it remains constant, transport of hazardous materials would be expected to triple along with other container traffic. In addition to container traffic,

hazardous materials are transported via company trucks (for example gas companies transport gasoline, diesel and other flammable substances) various industrial users transport materials for their businesses (raw materials and waste products), and so on.

In general, it is anticipated that the increase in transport of hazardous materials would result in a less-than-significant hazard to the public and/or the environment, because handling and transport of hazardous materials and wastes are subject to numerous laws, regulations, and health and safety standards set forth by federal, State, and local authorities that regulate the proper handling of such materials and their containers. These include the EPA, OSHA, USDOT, and the Food and Drug Administration (FDA) for the federal government. State agencies, including the Cal/EPA), DTSC for example is within Cal/EPA, have parallel and, in some cases, more stringent rules governing the use of hazardous materials.

USDOT requires that hazardous waste inventories (which are used to ensure that hazardous wastes are strictly monitored and tracked from the point of generation through ultimate disposal) be maintained. To operate in California, all hazardous waste transporters must be registered with the DTSC. Unless specifically exempted, hazardous waste transporters must comply with the California Highway Patrol Regulations, the California State Fire Marshal Regulations, and the USDOT Regulations.

The construction and maintenance of transportation facilities as well as development that occurs pursuant to the Plan would involve the use of hazardous materials such as fuels, solvents, paints and other architectural coatings. The use and storage of these materials is regulated by local fire departments, Certified Unified Program Agencies (CUPAs), and the Cal OSHA. Materials remaining after project construction can likely be re-used on other projects. For materials that cannot be or are not reused, disposal would be regulated by DTSC under State and federal hazardous waste regulations.

The 2012-2035 RTP/SCS includes refinements to a truck-only freight lane system extending from the San Pedro Bay Ports to downtown Los Angeles, eventually reaching the Ontario Freeway (I-15) in San Bernardino County via an east-west segment. The 2012-2035 RTP/SCS includes a refined concept for the east-west segment of the freight corridor. An initial segment of the east-west freight corridor would connect to the I-15 just north of the San Bernardino Freeway (I-10).

Increased transport and handling of hazardous materials particularly by goods movement facilities could result in increased risk of accidental releases reaching neighborhoods and communities adjacent to the transportation facilities (see Impact 3.7-2 below).

SCAG's GIS data was used to analyze where major freeway, rail, and transit projects would intersect residential development and business uses. A 150-foot potential impact zone was identified around freeway, rail, and transit projects in the 2012-2035 RTP/SCS to determine the acreage of neighborhoods and communities that could be affected by potential hazardous materials emissions. It is estimated that in 2035, approximately 3,235 acres of low, medium, and rural density residential and 5,941 acres of commercial land uses would be within 150 feet of, and could be affected by, major transportation projects in the 2012-2035 RTP/SCS (see Table 3.8-1 in Section 3.8 Land Use).

The 2012 RTP/SCS directs growth adjacent to transit and transportation facilities in order to reduce trips and trip lengths. With increasing growth adjacent to such facilities, there would be greater potential for exposure of sensitive receptors as well as other uses to risks associated with hazardous materials transport. This would be analyzed on a case-by-case basis.

Although individual projects would be required to comply with all existing regulations, due to the volume of projects (transportation and development) contained within the RTP/SCS it is possible that significant impacts could occur. Therefore, without Mitigation Measures **MM-HM1** through **MM-HM3**, impacts could be significant.

Impact 3.7-2: Potential to create a hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment during transportation.

Implementation of the 2012-2035 RTP/SCS would facilitate the movement of goods, including hazardous materials, through the region. The SCS would also guide growth (of all types, including industrial uses that use and generate hazardous materials. The 2012-2035 RTP/SCS includes 74,297 total regional lane miles. As a result of growth that would occur with or without the RTP it is anticipated that there will be a substantial increase in vehicle miles traveled (VMT) by trucks, a common mode of hazardous materials transport, as RTP/SCS improvements close critical gaps in the highway network. In addition, freight rail enhancements, truck mobility improvements, intermodal facilities, and other goods movement capacity enhancements are included in the Plan. Transportation of goods, in general, and hazardous materials in particular, can thus be expected to increase substantially with implementation of the 2012-2035 RTP/SCS. It is estimated that daily regional heavy duty truck VMT within the SCAG region will increase from 41 million in 2011 to 65 million in 2035, which is a 58 percent increase.

The past several RTP updates, as well as this one, have included the concept of user supported (toll) dedicated truck lane facilities. These facilities would be aligned to connect freight-intensive locations such as the ports, warehousing/distribution center locations and manufacturing locations. They would have fewer ingress/egress locations than typical urban interstates to smooth the flow of goods in the region. Additional improvements included in the 2012-2035 RTP/SCS would generally improve transportation safety, thus reducing the likelihood of hazardous material transportation incidents. Specific elements in the Plan, including rail-to-rail grade separations, rail operations safety improvements, truck mobility improvements such as truck-only freight corridors, and grade separations of streets and highways from rail lines, could be expected to reduce the level of risk posed by hazardous materials transport by separating freight transportation from other traffic types and reducing the risk of collisions.

Such improvements to the transportation system may provide an incentive for even greater goods shipment through the SCAG region, thus potentially offsetting this benefit. The imposition of tolls or fees for dedicated truck lane facilities may induce the transfer of some freight, including hazardous materials, to rail rather than truck. Federal statistics show that hazardous materials incidents are much less common by rail than on highways.[8] Implementation of Mitigation Measure **MM-HM3** would reduce impacts related to upset and accident conditions involving the release of hazardous materials, however, impacts would remain significant.

Impact 3.7-3: Potential to create a hazard to the public or the environment by emitting hazardous materials within one-quarter mile of a school.

As mentioned above, Plan projects as well as development anticipated to occur under the Plan would result in the use, transport and/or storage of potentially hazardous materials. The types and quantities of hazardous materials transported, used and stored is heavily regulated. Using SCAG's GIS data, the 2012-2035 RTP/SCS network of projects was overlaid on the region to determine the potential for effects related to hazardous materials emissions to impact schools. Results of the GIS analysis show that under the Plan, approximately 541 existing kindergarten through 12th grade schools are within a one-quarter mile buffer of

[8]USDOT, Pipeline and Hazardous Materials Safety Administration. 2011. *2009 Hazmat Summary by Mode of Transportation*, *http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/2009scause.pdf*, accessed November 2011.

the 2012-2035 RTP/SCS projects and could be impacted (see **Table 3.7-4**). Hazardous materials carried on roadways within one-quarter mile of schools could affect these schools if there were to be a release or incident during transportation. Compliance with all applicable local, State, and federal laws, and regulations, as described in the regulatory framework section above, regulate, control, or respond to hazardous waste, transport, disposal, or cleanup in order to ensure that hazardous materials do not pose a significant risk to nearby receptors.

TABLE 3.7-4: SCHOOLS, HOSPITALS AND NURSING HOMES WITHIN 0.25 MILES OF PLAN PROJECTS

Mode	No Project	2012-2035 RTP/SCS
Colleges	15	58
Hospitals	6	45
K-12 Schools	147	541
Nursing Homes	37	186
Senior Centers	6	47
Urgent Care Centers	4	36

SOURCE: SCAG, GIS Analysis, 2011; SCAG, Land Use, 2008.

However, due to the number of projects and amount of development included in the 2012-2035 RTP/SCS it is anticipated that significant impacts could occur. Implementation of Mitigation Measure **MM-HM4** would reduce impacts related to emitting hazardous materials within a quarter-mile of a school, however, impacts would remain significant.

Impact 3.7-4: Potential to create a hazard to the public or the environment through the disturbance of contaminated property during the construction of new transportation or expansion of existing transportation facilities and the disturbance of contaminated sites as a result of population, housing and employment growth in the region.

The 2012-2035 RTP/SCS includes transportation system improvements to close critical gaps in the transportation network that currently hinder access to certain parts of the region. Construction related to these improvements and other projects (including development undertaken pursuant to the Plan) in the 2012-2035 RTP/SCS could involve construction on or adjacent to sites that are contaminated (buildings and/or soil and/or groundwater due to past use or disposal of hazardous materials. Federal, State and local laws provide for remediation of these sites, and it is likely that the majority of contaminated sites have been identified or are easily identifiable from existing information. Given the intensity of past use of land, there are a substantial number of potentially contaminated sites in the SCAG region. In urban, as well as rural areas, many projects (both transportation and development) will likely need to address at least the potential for contamination. Because of the large number of contaminated sites and the risk associated with encountering and cleaning up of these sites, this impact could be significant.

The 2012-2035 RTP/SCS mobility and land use policies would influence population distribution, resulting in a potentially significant impact related to disturbance of contaminated sites by new urban development, most of which will be in urban areas. Future growth will be targeted in High Quality Transit Areas (HQTAs) in close proximity to transit. Consequently, the redevelopment and reuse of urban infill properties will become more common as the region grows. Implementation of Mitigation Measures **MM-HM1** through **MM-HM16** would reduce impacts related to redevelopment of contaminated sites, to less than significant.

Cumulative Impact 3.7-5: Potential to contribute a cumulatively significant increase in risk associated with hazardous materials transport outside of the SCAG region.

The SCAG travel demand model estimates vehicle trips (autos and trucks) in 2035, as a result of population, households, and employment projected for 2035. The year 2035 would be the year with the largest demand on the transportation system during the lifetime of the 2012-2035 RTP/SCS. The forecasted urban development and growth that would occur under the Plan and that would be accommodated by the transportation investments in the 2012-2035 RTP/SCS and the increased mobility provided by the 2012-2035 RTP/SCS would result in not only increased hazardous materials transport through the region but also outside the region. These trips would add to trips from outside the region to result in cumulative impacts outside the region. As the population increases through 2035, the number of trips in the SCAG region that originate, end or pass through Santa Barbara, San Diego and Kern counties as well as other counties and states would increase, including trips involving the transportation of hazardous materials. The 2012-2035 RTP/SCS would contribute to significant hazardous material transportation impacts in these other areas. Implementation of Mitigation Measures **MM-HM1** through **MM-HM4** would reduce cumulative impacts related to hazardous materials transport outside of the SCAG region, however, impacts would remain significant.

MITIGATION MEASURES

Mitigation Measures **MM-HM1** and **MM-HM2** shall be implemented by SCAG over the lifetime of the 2012-2035 RTP/SCS. Mitigation Measures **MM-HM3** through **HM-MM16** can and should be implemented by project sponsors (for both development and transportation projects) as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions.

Routine Transport, Use or Disposal of Hazardous Materials

MM-HM1: SCAG shall encourage the United States Department of Transportation (USDOT), the Office of Emergency Services, and California Department of Transportation (Caltrans) and the private sector to continue to conduct driver safety training programs.

MM-HM2: SCAG shall encourage the USDOT and the California Highway Patrol to continue to enforce speed limits and existing regulations governing goods movement and hazardous materials transportation.

Upset and Accident Conditions

MM-HM3: Project sponsors can and should comply with all applicable laws, regulations, and health and safety standards set forth by federal, state, and local authorities that regulate the proper handling of such materials and their containers to the routine transport, use, and disposal of hazardous materials does not create a significant hazard to the public or the environment.

Schools

MM-HM4: Project sponsors can and should consider any known or planned school locations when determining the alignment of new transportation projects and modifications to existing transportation facilities as well as any industrial or other use that could pose a hazard to students.

Disturbance of Contaminated Property During Construction

MM-HM5: Project sponsors can and should ensure that Best Management Practices (BMPs) are implemented as part of construction to minimize the potential negative effects to groundwater and soils. These should include the following:

- Follow manufacturer's recommendations on use, storage, and disposal of chemical products used in construction;
- Avoid overtopping construction equipment fuel gas tanks;
- During routine maintenance of construction equipment, properly contain and remove grease and oils;
- Properly dispose of discarded containers of fuels and other chemicals;
- Ensure that construction would not have a significant impact on the environment or pose a substantial health risk to construction workers and the occupants of the proposed development. Soil sampling and chemical analyses of samples should be performed to determine the extent of potential contamination beneath all UST's, elevator shafts, clarifiers, and subsurface hydraulic lifts when on-site demolition, or construction activities would potentially affect a particular development or building; and
- If soil, groundwater or other environmental medium with suspected contamination is encountered unexpectedly during construction activities (e.g., identified by odor or visual staining, or if any underground storage tanks, abandoned drums or other hazardous materials or wastes are encountered), the project sponsor should cease work in the vicinity of the suspect material, the area should be secured as necessary, and the project sponsor should take all appropriate measures to protect human health and the environment. Appropriate measures should include notification of regulatory agency(ies) and implementation of actions as necessary, to identify the nature and extent of contamination. Work should not resume in the area(s) affected until the measures have been implemented under the oversight of the City or regulatory agency, as appropriate.

MM-HM6: As appropriate, project sponsors can and should submit documentation to determine whether radon or vapor intrusion from the groundwater and soil is located on-site as part of the Phase I documents. The Phase I analysis should be submitted to the appropriate government agency for review and approval, along with a Phase II report if warranted by the Phase I report for the project site. The reports should make recommendations for remedial action, if appropriate, and should be signed by a Registered Environmental Assessor, Professional Geologist, or Professional Engineer. The project sponsor should implement the approved recommendations.

MM-HM7: As appropriate each project sponsor can and should submit a Hazardous Materials Business/Operations Plan for review and approval by the appropriate local agency. Once approved this plan should be kept on file with the Lead Agency (or other appropriate government agency) and will be updated as applicable. The purpose of the Hazardous Materials Business/Operations Plan is to ensure that employees are adequately trained to handle the materials and provides information to the local fire protection agency should emergency response be required. The Hazardous Materials Business/Operations Plan should include the following:

- The types of hazardous materials or chemicals stored and/or used on-site, such as petroleum fuel products, lubricants, solvents, and cleaning fluids
- The location of such hazardous materials

- An emergency response plan including employee training information
- A plan that describes the manner in which these materials are handled, transported and disposed

MM-HM8: Project sponsors can and should implement all of the following Best Management Practices (BMPs) regarding potential soil and groundwater hazards.

- Soil generated by construction activities should be stockpiled on-site in a secure and safe manner. All contaminated soils determined to be hazardous or non-hazardous waste must be adequately profiled (sampled) prior to acceptable reuse or disposal at an appropriate off-site facility. Specific sampling and handling and transport procedures for reuse or disposal should be in accordance with applicable local, State and federal agencies laws.
- Groundwater pumped from the subsurface should be contained onsite in a secure and safe manner, prior to treatment and disposal, to ensure environmental and health issues are resolved pursuant to applicable laws and policies. Engineering controls should be utilized, which include impermeable barriers to prohibit groundwater and vapor intrusion into the building.
- Prior to issuance of any demolition, grading, or building permit, the sponsor should submit for review and approval by the Lead Agency (or other appropriate government agency), written verification that the appropriate federal, State and/or local oversight authorities, including, but not limited to the Regional Water Quality Control Board (RWQCB), have granted all required clearances and confirmed that the all applicable standards, regulations and conditions for all previous contamination at the site.

MM-HM9: Project sponsors can and should consult all known databases of contaminated sites and undertake a standard Phase I Environmental Site Assessment in the process of planning, environmental clearance, and construction for projects included in the 2012-2035 RTP/SCS, including development projects.

MM-HM10: Where contaminated sites are identified, project sponsors can and should develop appropriate mitigation measures to assure that worker and public exposure is minimized to an acceptable level and to prevent any further environmental contamination as a result of construction.

MM-HM11: If asbestos-containing materials (ACM) are found to be present in building materials to be removed project sponsors can and should submit specifications signed by a certified asbestos consultant for the removal, encapsulation, or enclosure of the identified ACM in accordance with all applicable laws and regulations, including but not necessarily limited to: California Code of Regulations, Title 8; Business and Professions Code; Division 3; California Health and Safety Code Section 25915-25919.7; and other local regulations as applicable.

MM-HM12: Prior to issuance of demolition, grading, or building permits, project sponsors can and should submit to the appropriate agency responsible for hazardous materials/wastes oversight, a Phase II Environmental Site Assessment report if warranted by a Phase I report for the project site. The reports should make recommendations for remedial action, if appropriate, and should be signed by a Registered Environmental Assessor, Professional Geologist, or Professional Engineer.

MM-HM13: Project sponsors can and should submit a comprehensive assessment report to the appropriate agency, signed by a qualified environmental professional, documenting the

presence or lack thereof of ACM, lead-based paint, and any other building materials or stored materials classified as hazardous waste by State or federal law.

MM-HM14: If a Phase II Environmental Site Assessment report recommends remedial action, the project sponsor can and should:

- Consult with the appropriate local, State, and federal environmental regulatory agencies to ensure sufficient minimization of risk to human health and environmental resources, both during and after construction, posed by soil contamination, groundwater contamination, or other surface hazards including, but not limited to, underground storage tanks, fuel distribution lines, waste pits and sumps;
- Obtain and submit written evidence of approval for any remedial action if required by a local, State, or federal environmental regulatory agency; and
- Submit a copy of all applicable documentation required by local, State, and federal environmental regulatory agencies, including but not limited to: permit applications, Phase I and II environmental site assessments, human health and ecological risk assessments, remedial action plans, risk management plans, soil management plans, and groundwater management plans.

MM-HM15: If lead-based paint is present, project sponsors can and should submit specifications to the appropriate agency, signed by a certified Lead Supervisor, Project Monitor, or Project Designer for the stabilization and/or removal of the identified lead paint in accordance with all applicable laws and regulations, including but not necessarily limited to: California Occupational Safety and Health Administration's (Cal OSHA's) Construction Lead Standard, Title 8 California Code of Regulations (CCR) Section 1532.1 and Department of Health Services (DHS) Regulation 17 CCR Sections 35001-36100, as may be amended. If other materials classified as hazardous waste by State or federal law are present, the project sponsor should submit written confirmation to the appropriate local agency that all State and federal laws and regulations should be followed when profiling, handling, treating, transporting and/or disposing of such materials.

MM-HM16: If materials classified as hazardous waste by State or federal law are present, project sponsors can and should submit written confirmation to appropriate local agency that all State and federal laws and regulations should be followed when profiling, handling, treating, transporting and/or disposing of such materials.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Routine Transport, Use or Disposal of Hazardous Materials

Implementation of Mitigation Measures **MM-HM1** and **MM-HM2** would reduce potential impacts related to routine transport, use or disposal of hazardous materials to less than significant.

Upset and Accident Conditions

Implementation of Mitigation Measure **MM-HM3** would reduce potential impacts related to upset or accident conditions involving the release of hazardous materials into the environment. However, given the large volume of hazardous materials currently being transported throughout the SCAG region, as well as improvements to the regional transportation system that would facilitate an increase in the transportation of all goods, including hazardous materials, impacts would remain significant.

Schools

Implementation of Mitigation Measure **MM-HM4** would reduce impacts related to hazardous materials emissions in the vicinity of a school. However, given the number of schools within a quarter-mile of planned 2012-2035 RTP/SCS projects, impacts would remain significant.

Disturbance of Contaminated Property During Construction

Implementation of Mitigation Measures **MM-HM5** through **MM-HM16** would ensure that contaminated properties are identified and appropriate steps are taken to minimize human exposure and prevent any further environmental contamination. Impacts would be less than significant after mitigation.

Cumulative Effects Outside the Region

Mitigation Measures **MM-HM1** through **MM-HM4** would reduce cumulative impacts related to hazardous materials transport outside the region. Risk of accidents and potential impacts to schools outside the region would be cumulatively significant impacts.

COMPARISION WITH THE NO PROJECT ALTERNATIVE

Implementation of the 2012-2035 RTP/SCS would result in the same regional total population as the No Project Alternative. Population for both No Project and the Plan is projected to be approximately 22.1 million people. However, no regional transportation investments would be made beyond the existing programmed projects under the No Project Alternative. The population distribution is assumed to follow past trends, uninfluenced by additional transportation investments and growth polices contained within the 2012-2035 RTP/SCS.

Direct Impacts

The No Project Alternative would result in the construction of approximately 68,040 new lane miles compared with over 74,297 new lane miles in the 2012-2035 RTP/SCS. Based on GIS analysis of existing uses adjacent to Plan and No Plan projects, new transportation projects in the No Project Alternative would be within a one-quarter mile radius of 147 kindergarten through 12th grade schools. The Plan projects would impact an additional 394 schools. Under the No Project Alternative, new highway, transit, and freight rail projects would be within 150 feet of 359 acres of residentially designated land and 266 acres of commercial land uses. This is far fewer acres of potentially affected neighborhoods and communities than under the 2012-2035 RTP/SCS. Further, because the plan emphasizes concentrating future development in areas well served by transportation infrastructure, the number of households impacted by the plan will be greater than in the No Project Alternative. This additional impact cannot be reliably quantified with available information. This is because it is infeasible for the plan to assume all the site sensitive factors such as specific locations, densities, and orientation as related to future development. Because there would be fewer transportation projects built, the No Project Alternative could result in a smaller increase in the movement of hazardous materials around the SCAG region, resulting in fewer associated risks.

Without the transportation system improvements incorporated in the 2012-2035 RTP/SCS, vehicle miles travelled (VMT) and vehicle hours travelled (VHT) would increase more by 2035 for the No Project Alternative than for the project. Thus, there would be more opportunities for accidents with vehicles transporting hazardous materials in the No Project Alternative than in the Plan. Also, with fewer new roadways constructed, hazardous materials transport would be concentrated on existing routes, and could not be diverted to dedicated lanes or grade-separated from automobile traffic. Construction related to improvements and other projects in the 2012-2035 RTP/SCS could involve construction on or adjacent to a

greater number of potentially contaminated sites than under the No Project Alternative. In addition, the Plan assumes the use of urban form strategies that would encourage greater property reuse and more infill development than under the No Project Alternative. Thus, it is more likely that previously contaminated sites would be encountered under the Plan than the No Project Alternative. **On balance, because the Plan would add transportation facilities thereby impacting more neighborhoods and because land uses would be concentrated next to transportation facilities, it is anticipated that the Plan impacts would be greater than No Project impacts due to increased number of transportation projects and number of lane miles. As noted this impact is offset somewhat by improved performance and safety in the transportation system.**

Cumulative Effects Outside the Region

With the construction of fewer new lane miles and other transportation projects in the No Project Alternative compared to the Plan, more transportation demand could be transferred to surrounding counties, and therefore, more hazardous materials transportation could potentially be facilitated in those counties. **No Project impacts could be greater than the Plan impacts for Cumulative Impact 3.7-5.**

3.8 LAND USE AND AGRICULTURAL RESOURCES

This section describes the current land uses in the SCAG region, discusses the potential impacts of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategies (2012-2035 RTP/SCS or Plan) on land use, identifies mitigation measures for these impacts, and evaluates the residual impacts of this Plan.

REGULATORY FRAMEWORK

Federal

United States Environmental Protection Agency (USEPA). The USEPA implements the National Environmental Policy Act (NEPA). NEPA provides information on expected environmental effects of federally funded projects. Impacts on land uses and conflicts with state, regional, or local plans and policies are among the considerations included in the regulations. The regulations also require that projects requiring NEPA review seek to avoid or minimize adverse effects of proposed actions and restore and enhance environmental quality as much as possible.

United States Forest Service (USFS). The USFS manages approximately 2.3 million acres of national forests in the SCAG region. The four national forests in the region are the Angeles National Forest, San Bernardino National Forest, Los Padres National Forest, and the Cleveland National Forest.

United States Forest Service (USFS) National Scenic Byways Program. The USFS also has a National Scenic Byways Program, independent from the BLM program, to indicate roadways of scenic importance that pass through national forests. The SCAG region includes Forest Service Scenic Byways in the counties of San Bernardino, Ventura, Los Angeles, and Riverside.

United States Natural Resources Conservation Service (NRCS). The NRCS maps soils and farmland uses to provide comprehensive information necessary for understanding, managing, conserving and sustaining the nation's limited soil resources. The NRCS manages the Farmland Protection Program, which provides funds to help purchase development rights to keep productive farmland in agricultural uses.

Federal Farm and Ranchland Protection Program (FRPP). The FRPP, also referred to as the Farmland Protection Program (FPP), is a voluntary easement purchase program that helps farmers and ranchers keep their land in agriculture. Pursuant to the Farmland Protection Policy Act (FPPA) of 1981 Sections 1539-1549, 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. FPP is reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill). The NRCS manages the program. Funds are awarded 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.

United States Forest Service (USFS) National Scenic Byways Program. The USFS also has a National Scenic Byways Program, independent from the BLM program, to indicate roadways of scenic importance that pass through national forests. The SCAG region includes Forest Service Scenic Byways in the counties of San Bernardino, Ventura, Los Angeles, and Riverside.

Federal Environmental Quality Incentives Program (EQIP). EQIP is a voluntary program that provides assistance to farmers and ranchers who face threats to soil, water, air, and related natural resources on their land.

United States Army Corps of Engineers (ACOE). Among its responsibilities, the ACOE administers Section 404 of the Clean Water Act (CWA), which governs specified activities in waters of the United States, including wetlands. In this role, the ACE requires that a permit be obtained if a project would place structures, including dredged or filled materials, within navigable waters or wetlands, or result in alteration of such areas.

United States Bureau of Land Management (BLM). The BLM manages approximately 10 million acres of the SCAG region, primarily in the eastern portion of the region. The California Desert Conservation Area Plan is used to manage BLM-controlled areas. The BLM also implements biological resource management policies through its designation of Areas of Critical Environmental Concern.

United States National Park Service (NPS). The NPS manages national parks and wilderness areas. Two national parks and one wilderness area are located in the SCAG region: Joshua Tree National Park, a portion of Death Valley National Park, and the Santa Monica Mountains National Recreation Area.

United States Fish and Wildlife Service (USFWS). The USFWS administers the federal Endangered Species Act and designates critical habitat for endangered species. The USFWS also manages the National Wildlife Refuges in the SCAG region. These include the Salton Sea National Wildlife Refuge (in Imperial County) and Hopper Mountain National Wildlife Refuge (in Ventura County).

State

California Coastal Commission. The California Coastal Commission plans for and regulates development in the coastal zone consistent with the policies of the California Coastal Act. The Commission also administers the federal Coastal Zone Management Act in California.[1] As part of the Coastal Act, cities and counties are required to prepare a local coastal program (LCP) for the portion of its jurisdiction within the coastal zone. With an approved LCP, cities and counties control coastal development that accords with the local coastal plan. If no local coastal plan has been approved, the Coastal Commission controls coastal development.[2]

California Department of Conservation. In 1982, the State of California created the Farmland Mapping and Monitoring Program within the California Department of Conservation to carry on the mapping activity from the NRCS on a continuing basis. The California Department of Conservation administers the California Land Conservation Act of 1965, also known as the Williamson Act, for the conservation of farmland and other resource-oriented laws. Farmland maps are compiled by the Department of Conservation Farmland Mapping and Monitoring Program (FMMP,) pursuant to the provisions of Section 65570 of the California Government Code. These maps utilize data from the United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) soil surveys and represent an inventory of agricultural resources. The maps use eight classification categories, the top four of which are regarded as

[1]The other federally designated agency is the Bay Conservation and Development Commission (BCDC) which operates outside of the SCAG region.

[2]Fulton, W. 1999. *Guide to California Planning*. Point Arena, CA: Solano Press Books.

"Important Farmland" for mapping purposes, and include Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance.

California Department of Fish and Game (CDFG). The land use mandate of the CDFG is to protect rare, threatened, and endangered species by managing habitat in legally designated ecological reserves or wildlife areas. CDFG reserves located in the SCAG region include the Bolsa Chica Ecological Reserve (Orange County) and Imperial State Wildlife Area (Imperial County).

California Department of Forestry and Fire Protection (DFF). The DFF reviews and approves plans for timber harvesting on private lands. In addition, through its responsibility for fighting wildland fires, the CDFG plays a role in planning development in forested areas.

California Department of Parks and Recreation. The California Department of Parks and Recreation manages and provides sites for a variety of recreational and outdoor activities. The California Department of Parks and Recreation is a trustee agency that owns and operates all state parks and participates in land use planning that affects State parkland.

California Department of Transportation (Caltrans). The Caltrans jurisdiction includes right-of-ways of state and interstate routes within California. Any work within the right-of-way of a federal or State transportation corridor is subject to Caltrans regulations governing allowable actions and modifications to the right-of-way. Caltrans includes the Division of Aeronautics, which is responsible for airport permitting and establishing a county Airport Land Use Commission (ALUC) for each county with one or more public airports. ALUCs are responsible for the preparation of land use plans for areas near aviation facilities.

California Farmland Conservancy Program (CFCP). The CFCP seeks to encourage the long-term, private stewardship of agricultural lands through the voluntary use of agricultural conservation easements. The CFCP provides grant funding for projects which use and support agricultural conservation easements for protection of agricultural lands. As of April 2005, the CFCP has funded more than 50 easement projects in California, including nearly 25,000 acres in more than a dozen counties. CFCP has also funded a number of planning grants, including some with regional or statewide value. Within the eight-county study area, CFCP has awarded grants for planning and policy projects within the counties of Kern and Ventura.

California Land Conservation Act (Williamson Act). The Williamson Act is the only established program that directly involves State government in an administrative or fiscal capacity. The Act creates an arrangement whereby private landowners voluntarily restrict their land to agricultural and compatible open space uses under a rolling ten-year contract. In return, parcels are assessed for property tax purposes at a rate consistent with their actual use, rather than their potential market value.

Farmland Security Zone (FSZ). In August of 1998, the legislature enhanced the Williamson Act with the FSZ provisions. The FSZ provisions offer landowners greater property tax reduction in return for a minimum rolling contract term of 20 years.

Local Agencies and Regulations

Public agencies are entrusted with compliance with the CEQA and its provisions are enforced, as necessary, through litigation and the threat thereof. CEQA defines a significant effect on the environment as a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by the project. Land use is a required impact assessment category under CEQA.

Southern California Association of Governments (SCAG). As related to land use, SCAG is authorized to undertake intergovernmental review for federal assistance and direct federal development pursuant to Presidential Executive Order 12,372. Pursuant to Public Resources Code Sections 21083 and 21087 and CEQA Guidelines Sections 15206 and 15125(b), SCAG reviews projects of regional significance for consistency with regional plans. SCAG is also responsible for preparation of the Regional Housing Needs Assessment (RHNA), pursuant to California Government Code Sections 65584 to 65584.05. Among other purposes, SCAG's RHNA provides a tool for providing local affordable housing development strategies.

Local Agency Formation Commissions (LAFCO). The LAFCO is the agency in each county that has the responsibility to create orderly local government boundaries, with the goal of encouraging "planned, well-ordered, efficient urban development patterns," the preservation of open-space lands, and the discouragement of urban sprawl. While LAFCOs have no direct land use authority, their actions determine which local government will be responsible for planning new areas. LAFCOs address a wide range of boundary actions, including creation of spheres of influence for cities, adjustments to boundaries of special districts, annexations, incorporations, detachments of areas from cities, and dissolution of cities.

Land Conservation Trust. Land conservation trust is another type of organization devoted to protecting open space, agricultural lands, wildlife habitats, and natural resource lands. A land trust is a nonprofit organization that, as all or part of its mission, actively works to conserve land by undertaking or assisting in land or conservation easement acquisition, or by its stewardship of such land or easements. 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.

Coastal Conservancy. Since its establishment in 1976, the Coastal Conservancy has completed over 600 projects, with over 300 projects currently active. These projects include construction of trails and other public access facilities, restoration and enhancement of wetlands and other wildlife habitat, restoration of public piers and urban waterfronts, preservation of farmland, and other projects in line with the goals of California's Coastal Act, the San Francisco Bay Plan, and the San Francisco Bay Area Conservancy.

General Plans. The most comprehensive land use planning for the SCAG region is provided by city and county general plans, which local governments are required by State law to prepare as a guide for future development. General plans contain goals and policies concerning topics that are mandated by State law or which the jurisdiction has chosen to include. Required topics are land use, circulation, housing, conservation, open space, noise, and safety. Other topics that local governments frequently choose to address include public facilities, parks and recreation, community design, and growth management, among others. City and county general plans must be consistent with each other. County general plans must cover areas not included by city general plans (i.e., unincorporated areas).

Specific and Master Plans. A city or county may also provide land use planning by developing community or specific plans for smaller, more specific areas within their jurisdiction. These more localized plans provide for focused guidance for developing a specific area, with development standards tailored to the area, as well as systematic implementation of the general plan.

Zoning. City and county zoning codes are the set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code presents standards for different uses and identifies which uses are allowed in the various zoning districts of the jurisdiction. Since 1971, State law has required the city or county zoning code to be consistent with the jurisdiction's general plan.

Growth Control. Local growth control measures endeavor to manage community growth by various methods, including tying development to infrastructure capacity, limiting the number of new housing units, setting limits on the increase of commercial square footage, and the adoption of urban growth boundaries, among others.

EXISTING SETTING

The SCAG region is comprised of six counties: Imperial, Orange, Los Angeles, Riverside, San Bernardino, and Ventura, and totals approximately 38,000 square miles in area (almost 25 million acres). The region stretches from the state borders with Nevada and Arizona to the Pacific Ocean and from the southernmost edge of the Central Valley to the Mexican border. The region includes the county with the largest area in the nation, San Bernardino County, as well as the county with the highest population in the nation, Los Angeles County. This vast area includes millions of acres of open space and recreational land as well as large amounts of farmland and a population of more than 18 million people.[3] Regional distribution of important farmlands and grazing lands are shown on **Map 3.8-1** located in Chapter 8 (Maps). **Map 3.8-2** shows persons per square mile within each of the six counties within the SCAG Region. The SCAG region is comprised of numerous types of land uses including residential, commercial/office, industrial, institutional, agricultural, and open space land uses, as shown in **Map 3.8-3**. **Map 3.8-4** shows the existing General Plan land use designations. Each land use is discussed in further detail below.

Based on available data from the California Legacy Project (CLP 2005), nearly 17 million acres in the SCAG region are in public ownership, primarily federal. **Map 3.8-5** shows the general ownership of open space and recreation lands, water, vacant, and agriculture by subregion. As a whole, nearly 23 million acres are considered "open space." Vacant lands account for more than 20 of the 25 million acres and include the region's national forests, state parks, military installations, other public lands, and various private holdings. Federal and state recreation lands included in the vacant category include lands administered by the BLM, Los Padres National Forest, Angeles National Forest, Cleveland National Forest, San Bernardino National Forest, Joshua Tree National Park, Death Valley National Park, the Mojave Preserve, and Anza Borrego Desert State Park. Military lands included in the vacant category include: Barstow Marine Corps Logistics Base, Edwards Air Force Base, El Centro Naval Air Facility, Fort Irwin, Los Angeles Air Force Base, March Air Reserve Base, Naval Warfare Assessment Station Corona, Naval Weapons Station Seal Beach, Point Magu Naval Air Weapons Station, Twenty-nine Palms Marine Corps Combat Center, and Chocolate Mountains Aerial Gunnery Range. With limited exceptions, the military lands are not open to the public. Farmlands and certain ranch operations account for more than 1 million acres; this excludes large areas of rangelands that are encompassed in the "vacant undifferentiated" category. Approximately 2.1 million acres in the region are developed, including approximately 100,000 acres used for transportation facilities.

As shown in **Map 3.8-6**, urban centers in the SCAG region is in the form of clusters, linked by freeways and commercial corridors interspersed with identifiable activity centers. Most existing urban development is found along the coastal plains of Los Angeles, Orange, and Ventura counties, as well as in adjoining valleys that extend inland from the coastal areas. Urban development also has moved into the inland valleys such as the Antelope, San Bernardino, Yucca, Moreno, Hemet–San Jacinto, Coachella, and Imperial Valleys. A map depicting city and county boundaries is provided as **Map 3.8-7**.

Downtown Los Angeles is the largest urbanized center within the SCAG region. Other urbanized areas in Los Angeles County include Long Beach, Burbank, Glendale, Pasadena and Pomona. Office-core centers have emerged in Woodland Hills, Universal City, Westwood, around Los Angeles International Airport (LAX), and Century City. In the other five counties within the SCAG region, urban centers exist in the cities

[3]SCAG projections for 2011 indicate a population total of **18,257,907**.

of Riverside, San Bernardino, Santa Ana, Anaheim, Irvine, Oxnard and Ventura. Development centers in desert areas include the Lancaster-Palmdale corridor in the Antelope Valley (Los Angeles County); the Hesperia-Victorville corridor in Yucca Valley (San Bernardino County); and the Palm Springs-Palm Desert - Indio corridor in the Coachella Valley (Riverside County). El Centro is the county seat and focal point of activity in Imperial County. There is also substantial activity occurring in Imperial County at the three ports of entry along the border with Mexico.

Much of the development in San Bernardino and Riverside Counties has been on unincorporated county land. Areas that were rural twenty years ago are quickly becoming suburban. Riverside County adopted the County General Plan that strives to create a high quality, balanced, and sustainable environment for the citizens of Riverside County and to make Riverside County's communities great places to live, work, and play. The County of Ventura and cities within the county have developed policies seeking to maintain a balance of protecting agricultural land while providing jobs and housing within a heavily used transportation network. The approach has been to provide urban growth boundaries as a way of channeling development and preserving farmland. These plans and initiatives affect how land is used in the future.

Within the older central cities, communities are being revitalized as buildings are converted into artist lofts and apartments. As the population ages, as land becomes scarce, and as the ethnic make-up of the region continues to change, developers have been turning to different types of housing and commercial developments, including townhouses, condominiums, apartments, and mixed-use developments that combine commercial and office uses. Residential units are appearing in traditionally commercial areas in Los Angeles, Long Beach, Santa Ana, and Pasadena. Senior housing located near amenities is gaining popularity. At the same time buildings are being recycled into new uses and there are movements across the region to preserve historic structures and places. Increasingly, communities across the region are recognizing the value of different styles of architecture and the different features that make a place unique.

Tribal Lands

Indian Trust Assets (ITAs) include land, natural resources, money, or other assets held by the federal government in trust or that are restricted against alienation for Indian tribes or individuals. The Department of Interior Order No. 3175 requires all its bureaus and offices to explicitly address anticipated effects on ITAs in planning, decision, and operation documents. The Bureau of Indian Affairs (BIA) develops inventories of ITAs for all Indian tribes. Tribes must conduct soil and range inventories, land evaluations and range utilization; collect data about soil productivity, erosion, stability problems, and other physical land factors for program development, conservation planning, and water rights claims settlements. In addition, tribes are required to develop land management plans.[4] Sixteen tribal lands each with respective governments exist throughout the SCAG region and include Agua Caliente Band of Cahuilla Indians, Augustine Band of Mission Indians, Cabazon Band of Mission Indians, Cahuilla Band of Mission Indians, Chemehuevi Reservation, Colorado River Reservation, Fort Mojave Indian Tribe, Fort Yuma Reservation, Morongo Band of Mission Indians, Pechanga Band of Luiseno Indians, Ramona Band of Mission Indians, San Manuel Band of Mission Indians, Santa Rosa Band of Mission Indians, Soboba Band of Luiseno Indians, Torres-Martinez Desert Cahuilla Indians, and Twentynine Palms Band of Mission Indians. **Map 3.8-8** shows the tribal lands located within the SCAG region.

Agricultural Land

Farmlands and rangelands are agricultural lands that are part of the region's open landscape and entail various types and degrees of modifications to natural lands. Farmlands include irrigated and non-irrigated

[4] Bureau of Indian Affairs, Branch of Agriculture and Rangeland Development, Accessed September 26, 2011, *http://www.bia.gov/WhoWeAre/BIA/OTS/NaturalResources/AgrRngeDev/index.htm*.

crop production. Rangelands include any expanse of natural land that is not fertilized, irrigated, or cultivated and is predominately used for grazing by livestock and wildlife.

The distribution of farmlands and rangelands in the SCAG region and vicinity is based primarily on data provided by the California Department of Conservation. It also provides a summary of existing plans and programs in the region to conserve agricultural lands, plus a summary of growth management plans in other states that include provisions for conserving agricultural lands.

Based on 2008 estimates prepared by the California Department of Conservation (CDC), there are approximately 2.65 million acres of agricultural lands in the SCAG region: approximately 1.17 acres of farmland and 1.48 million acres of rangeland. This estimate is substantially higher that the estimate in the 2005 SCAG land use inventory because the latter includes substantial areas of rangeland under the "vacant" category. It also should be noted that the CDC estimate is based on a selective inventory of agricultural lands, and the SCAG inventory is based on aerial imagery interpretation.[5]

As indicated in Table 3.3-3 in Section 3.3 Biological Resources and Open Space, there is substantially more farmland than rangeland in Ventura, Riverside, and Imperial counties and the reverse in Los Angeles, Orange, and San Bernardino counties. By comparison, Kern County has more farmland than the six SCAG counties combined and also has more total acres of rangeland. As discussed above, **Map 3.8-1** shows the regional distribution of important farmlands and grazing lands.

Historically, development patterns in the region have been tied as much to the conversion of agricultural lands as to the consumption of natural lands for urban uses. A key issue in the region today is whether the high rate of farmland conversion in recent years can be slowed to prevent irreversible losses. An estimated 230,000 acres of farmland and grazing land were converted to non-agricultural uses and/or applied for development entitlements between 1996 and 2004. If this trend continues unabated, the existing inventory of agricultural lands could be reduced by 700,000 before 2030.

Forest Land

The montane and subalpine vegetation in the SCAG region consists of conifer-dominated forests and woodland. These generally occur at elevations of 3,000 feet or more in the Transverse and Peninsular Ranges. Oak-dominated woodlands and forests are found at low- to mid-elevations of the Transverse and Peninsular Ranges. Canyon live oak (*Quercus chrysolepis*) forms forests with Coulter pine (*Pinus coulteri*), bigcone-fir (*Pseudotsuga macrocarpa*), Douglas-fir (*P. menziesii*), and interior live oak (*Quercus wislizenii*) on the higher and inner slopes of the mountains, as well as forming riparian forests along seasonal streams. Coast live oak woodland forms on more coastal slopes, while Engelmann oak (*Q. engelmannii*) woodland and valley oak (*Q. lobata*) woodland grow on deeper alluvial slopes and valleys. California walnut (*Juglans californica*) is found associated with coast live oak, usually on north slopes, and in some places becomes the dominant species. Woodland consists of trees with an understory of grasses and herbs. Introduced grasses dominate the understory, although in some cases native bunchgrasses may be present.

The CDFG recognizes valley oak woodland, Engelmann oak woodland, and California walnut woodland as sensitive woodland communities in the SCAG region. These communities have shown a dramatic decline due to urban and agricultural development in this century. Hardwood upland forests are found on higher, wetter sites than oak woodlands and are distinguished from woodlands by a higher tree density. Walnut forests found on the south side of the San Gabriel Mountains to the Santa Ana Mountains, mainland cherry

[5]State of California Department of Conservation, Farmland Mapping and Monitoring Program: Important Farmland Data Availability, Land Use Conversion Tables, http://redirect.conservation.ca.gov/dlrp/fmmp/county_info_results.asp, accessed October 18, 2011.

forest historically found in Los Angeles County, island cherry (*Prunus ilicifolia* ssp. *lyonii)* forest and island ironwood (*Lyonothamnus floribundus*) forest found on the Channel Islands are considered sensitive natural communities.

At the lower elevations, Coulter pine forms open woodland with canyon live oak, black oak (Quercus kelloggii), and ponderosa pine and Jeffrey pine. At somewhat higher elevations, yellow (ponderosa and Jeffrey) pine forest dominate. Farther upslope, upper montane conifer forests are present, consisting of white fir and sugar pine, followed by mountain juniper (Juniperus occidentalis ssp. australis) woodland on open slopes and ridges and lodgepole pine (Pinus contorta) forest on flats and gentle slopes. The highest elevation forests are dominated by limber pine. These forests are found at the highest elevations of the San Bernardino Mountains. The actual elevation range of each forest type is dependent on other site factors, such as precipitation, moisture-holding capability of the soil, slope and aspect.

There are no true alpine areas within the highest mountains of the Transverse Range; that is, no areas that are climatically unable to support high-elevation conifer species. However, there are some treeless areas of talus, meadow, and exfoliating rock. Alpine vegetation is found in the talus of Mt. San Gorgonio. Such vegetation includes several species of sedge, rush, and various perennial herbs.

No state or federally listed species occur in the alpine barren and rock habitat. One special status plant species, Sierra podistera (*Podistera nevadensis*), is known from this habitat in the mountains of San Bernardino County, although it is currently believed to be extirpated there.

The Tecate cypress (*Cypressus forbesii*), is a fire-adapted conifer species found only on low fertility soils. This species grows in several stands in the SCAG region in the vicinity of Sierra Peak in Orange County. Tecate cypress forest is considered a special status natural community by the California Natural Diversity Database (CNDDB), and the Tecate cypress itself is a California Native Plant Society listed species.

The following describes in detail six overarching land uses across the region: residential, commercial/office, industrial, institutional, agricultural, and open space land uses.

Residential

The residential pattern of the SCAG region is largely shaped by topography. Most residents live in southern parts of Ventura, Los Angeles, and San Bernardino Counties with the urban form limited by national forests and mountains. In Orange County, residents live near the coast and west of the Cleveland National Forest. Residents also have moved inland to the high desert in northern Los Angeles and San Bernardino Counties and the low desert in the Coachella and Imperial Valleys.

The majority of medium- and high-density housing in the region is found in the urban core of the region, in Downtown Los Angeles, East Los Angeles, and the "West Side" of Los Angeles. Large cities, such as Long Beach, Santa Ana, Glendale, Oxnard, and Pasadena, also have concentrations of high-density development in their downtown areas. Several beach communities, such as the Cities of Santa Monica, Manhattan Beach, Hermosa Beach, Redondo Beach, Huntington Beach, and Newport Beach, have high density close to the ocean.

Surrounding suburbs are predominantly low-density housing tracts. Low-density housing expands west into Ventura County, east through southeast Los Angeles County, throughout much of Orange County, and through the western Inland Empire. The resort communities and cities of the Coachella Valley in Riverside County also are built primarily on a low-density scale.

The developing land on the urban fringe, such as the Antelope Valley of Los Angeles County and the Victorville-Hesperia area, Lucerne Valley, and Yucca Valley of San Bernardino County, also are primarily low density residential. The Imperial Valley in Imperial County is primarily an agricultural region with a growing, yet still regionally small, population that lives in primarily low-density developments.

Map 3.8-9 shows the household density across the region. This map illustrates that the urban core is the densest part of the region and that suburban household densities also are prevalent through the region.

Commercial/Office

Across the region, commercial development typically follows transportation corridors. Office development generally locates at the terminals of major transportation features, particularly airports and train stations, or at the intersection of major freeways. Downtown Los Angeles is the historical center of jobs in the region. LAX and John Wayne Airport have considerable office clusters around them. Office buildings tend to cluster around major intersections, including areas such as the "El Toro Y" (intersection of the I-5 and the I-405) and the "Orange Crush" (intersection of I-5, SR-22, and SR-57) in Orange County.

Map 3.8-10 depicts the employment density across the region. This map illustrates jobs located at major transportation intersections and along transportation corridors.

Industrial

The focal points of industrial activity in the region are the Ports of Los Angeles and Long Beach. Put together, these adjacent ports handle approximately 40 percent of the volume imported into the country and approximately 24 percent of the nation's exports. The industrial activity spreads north from the ports along the Alameda Corridor to Downtown Los Angeles and extends east through the City of Industry and the City of Commerce toward San Bernardino County.

Many manufacturing industries, distribution centers, and warehouses have established businesses in Riverside and San Bernardino Counties. This activity has made the Inland Empire a distribution center for the region, State, and nation. Adding to the goods coming by highway and rail through San Bernardino County are goods coming to the county by air through several airports that cater to air cargo, primarily Ontario International Airport. Industrial uses tend to cluster around cargo-handling airports to take advantage of transportation options.

Significant air cargo and associated industrial land uses also are located around LAX. A third port in the region, located in Port Hueneme in Ventura County, is also surrounded with industrial activity. Along the Mexican border, the three ports of entry in Imperial County have large amounts of commerce going back and forth between the two countries.

Extraction activities in the region focus on oil and minerals. Ventura County has extensive extraction activities in the far southwestern part of the county and along Route 126. These activities extend into Los Angeles County to the area around the City of Santa Clarita. Oil wells and oil refineries remain across southern Los Angeles County. Oil drilling and refining also takes place in Orange County, near Huntington Beach and Newport Beach. Significant mining operations take place in the eastern portion of Imperial County. Wind energy generation facilities are located in the San Gorgonio Pass between Banning and Palm Springs.

Institutional

Institutional land uses, which include large government and private operations, such as military bases, airports, and universities, encompass a considerable footprint in the region. Military operations consume a substantial quantity of land. The ten active duty military facilities in the SCAG region are listed below.[6]

- El Centro Naval Air Facility
- Los Angeles Air Force Base
- Joint Forces Training Base, Los Alamitos
- Naval Weapons Station, Seal Beach
- Naval Warfare Assessment Station, Corona
- March Air Reserve Base
- Barstow Marine Corps Logistics Base
- Fort Irwin
- Twenty-nine Palms Marine Corps Combat Center
- Naval Base Ventura County

In addition, land controlled by Edwards Air Force Base, based in Kern County, extends into Los Angeles and San Bernardino Counties. The Chocolate Mountains Aerial Gunnery Range in Imperial and Riverside Counties is also an institutional use that is off limits to the public.

A substantial quantity of land is dedicated to airports in Los Angeles County. In the Antelope Valley, a large portion of land is dedicated to airport uses at Palmdale Airport. LAX is another major institutional land use. Bob Hope Airport and Long Beach Airport are the other commercial airports in Los Angeles County. Airports in other parts of the region include Ontario International Airport, Southern California Logistics Airport, and San Bernardino International Airport in San Bernardino County, Palm Springs International Airport and March Inland Port in Riverside County, John Wayne Airport in Orange County, and numerous general aviation airports scattered across the SCAG region.

University and college campuses are located in every county of the SCAG region. The largest are universities in the University of California system (Irvine, Los Angeles, and Riverside) and the California State University system (Channel Islands, Dominguez Hills, Fullerton, Long Beach, Los Angeles, Northridge, San Bernardino, and San Diego-Imperial Valley Campus). California Polytechnic University at Pomona and the University of Southern California are the other large universities in the region. There are numerous smaller universities and colleges in the region, both public and private, as well as an extensive community college system that spans the SCAG region.

Open Space

Map 3.8-12 shows Existing Open Space, Recreation and Agricultural Land Uses throughout the region. Open spaces vary in size and location and generally include public parks, recreational facilities, and areas planned for such uses. Some open spaces also provide critical habitat, as discussed in Section 3.3 Biological Resources & Open Space.

[6]California military bases: Bases by county. Retrieved May 22, 2007, from U.S. Senator Barbara Boxer website: http://boxer.senate.gov/CAbases/county.cfm.

THRESHOLDS OF SIGNIFICANCE

Based on CEQA Appendix G, and as appropriate for the 2012-2035 RTP/SCS, the Plan would have a significant impact related to land use, agriculture and forest resources if it would:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;
- Physically divide an established community;
- Convert Prime Farmland Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses;
- Conflict with existing zoning for agricultural use or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production;
- Result in the loss of forest land or conversion of forest land to non-forest use; and/or
- Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

Methodology

The following summarizes the methodology used to evaluate the expected impacts of implementation of the proposed Plan on existing land uses, existing agriculture and forestry resources, and existing land use plans and policies.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of land use, agriculture, and forestry resources includes a comparison of the expected future conditions with the Plan and the expected future conditions if no Plan were adopted (No Project). **Map 3.8-13** shows the expected land use distribution for future (2035) with implementation of the 2012-2035 RTP/SCS. This evaluation is not included in the determination of the significance of impacts (which is based on a comparison to existing conditions); however, it provides a meaningful perspective on the effects of the 2012-2035 RTP/SCS.

Determination of Significance

The methodology for determining the significance of land use impacts compares the existing conditions to future (2035) conditions, as required in CEQA Section 15126.2(a).

The 2012-2035 RTP/SCS consists of a combination of transportation policies, objectives, investments, and land use-transportation measures (see Chapter 2.0 Project Description of this PEIR for the Plan's goals, policies transportation investments and land use policies). In addition, project growth forecasts were developed for a range of alternatives (see Chapter 4.0 Alternatives). For each alternative, differing sets of policies, objectives, and investments were applied. Alternative growth forecasts vary in their reliance on local input trend data and existing General Plans. The growth forecast for the No Project Alternative relies exclusively on trend data adjusted to reflect 2012-2035 RTP/SCS growth totals. The No Project Alternative indicates the land use pattern that could be expected without implementation of the 2012-2035 RTP/SCS. The 2035 population, households, and employment growth projections for each alternative are held constant at the regional level, but differ from one another in land use patterns. Changes in investments and policies would shift the land use patterns as a function of changes in mobility and land use decisions.

The potential for community disruption was assessed by evaluating the location of proposed transportation projects in relation to surrounding land uses and community development. Highway and transit extensions and major interchange projects were assumed to have a higher potential to disrupt or divide existing communities since they would involve the creation of new roadways. Highway widening and other projects along established transportation rights-of-way were assumed to have a lower potential to divide or disrupt existing communities and neighborhoods.

The following analysis is based on general descriptions of projects in the Plan (see Chapter 2 Project Description and Appendix B 2012-2035 RTP/SCS Project List) and is regional and programmatic in nature. This section is intended to serve as a regional cumulative analysis for local jurisdictions in the preparation of project specific environmental documentation and to provide a framework for mitigation measures.

Implementation of the 2012-2035 RTP/SCS would affect land use patterns and the consumption of agricultural land and forest resources. Expected significant impacts include substantial land use density growth in areas of the region adjacent to transit, right-of-way acquisitions that could separate residences from community facilities and services, and significant impacts on vacant natural lands, including agricultural and forested lands.

Both short-term construction related impacts as well as offsite impacts from new facilities would occur as a result of implementation of the 2012-2035 RTP/SCS. Indirect impacts from changes in land use patterns expected to occur due to the 2012-2035 RTP/SCS's transportation investments and land use policies are also identified.

IMPACTS

Impact 3.8-1: Potential to result in inconsistencies with currently applicable adopted local land use plans and policies.

SCAG has developed a land use distribution pattern to address actions and strategies included in the Sustainable Communities Strategy (SCS) portion of the 2012-2035 RTP/SCS. The SCS demonstrates the region's ability to attain and exceed the GHG emission reduction targets set forth by the ARB. The SCS outlines a plan for integrating the transportation network and related strategies with an overall land use pattern that responds to projected growth, housing needs and changing demographics, and transportation demands. The SCS focuses the majority of new housing and job growth in high-quality transit areas (HQTAs) and other opportunity areas in existing main streets, downtowns, and commercial corridors, resulting in an improved jobs-housing balance and more opportunity for transit-oriented development. This overall land use development pattern supports and compliments the proposed transportation network that emphasizes system preservation, active transportation, and transportation demand management measures. In

addition, the RTP contains the following goal: "[e]ncourage land use and growth patterns that facilitate transit and non-motorized transportation."

The 2012-2035 RTP/SCS contains transportation projects and strategies to help more efficiently distribute population, households, and employment growth in the region. Many of the of the land use strategies that support the region's transportation strategies were developed as a result of SCAG's Compass Blueprint Growth Vision process outlined in the SCS. This process involved extensive outreach to and input from local jurisdictions, including, counties, subregions and local city planners. SCAG has developed an integrated growth forecast that establishes population, employment, households and housing units forecast in the region for use in both the RHNA and the RTP. This integrated forecast is the basis for developing the land use assumptions at the regional and small area level.

In addition, the 2012-2035 RTP/SCS was built primarily from local General Plans and input from local governments, subregional COGs and County Transportation Commissions, using the Local Sustainability Tool. The adopted sub-regional SCSs of the Gateway Cities COG and the Orange County COG were integrated as provided into the regional SCS. These sub-regional SCSs were developed in close collaboration with SCAG and utilize various strategies that help achieve estimated GHG reduction targets.

As a result of this comprehensive and integrated approach, the transportation projects and strategies included in the 2012-2035 RTP/SCS are generally consistent with the county and regional level general plan data available to SCAG. However, general plans are updated on an inconsistent basis. Some of the general plans that SCAG relied upon when creating the 2012-2035 RTP/SCS are not current and may not reflect current planning policy or practice. In addition, the RTP/SCS's 2035 horizon year is beyond the timeline of many of the most recent general plans. It is likely that over the period of the 2012-2035 RTP/SCS, transportation projects and resulting growth will be inconsistent with currently adopted general plans. With these limitations, there will be inconsistencies with general plans and potentially significant effects. However, the 2012-2035 RTP/SCS recognizes that inconsistencies may still exist and therefore includes the policy to continue public outreach efforts and incorporate local input through the integrated growth forecast process in an aim to develop a more accurate forecast in future RTP/SCSs.

SCAG has no authority to adopt local land use plans or approve local land use projects that will implement the SCS. As described in the section below, SB 375 specifically provides that nothing in the law supersedes the land use authority of cities and counties. In addition, cities and counties are not required to change their land use plans and policies, including general plans, to be consistent with an RTP/SCS. However, local jurisdictions are encouraged by SCAG to consider the Proposed Actions and Strategies provided in Chapter 4, Sustainable Communities Strategy, of the Plan including strategies addressing Land Use, the Transportation Network, Transportation Demand Management (TDM), Transportation Systems Management (TSM) and Clean Vehicle Technology, which are discussed in Chapter 2, Project Description. In other words, SCAG encourages local jurisdictions to adopt and update general plans that are consistent with the 2012-2035 RTP/SCS in order to accomplish the goals of SB 375. To this end, implementation of **Mitigation Measures MM-LU1** through **MM-LU10** would reduce impacts related to potential conflicts with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the project; however, impacts would remain significant.

Impact 3.8-2: Potential to disrupt or divide established communities.

While the 2012-2035 RTP/SCS aims to complete major highway projects (such as the CETAP Intercounty Corridor A to connect Orange County with Riverside County), reduce travel delay by adding lanes to highways and arterials, and create complete streets such that vehicles and non-motorized transit can both use the streets simultaneously; construction and implementation of new transportation facilities or expansion of existing facilities could disrupt or divide established communities. Short-term construction impacts would include physical barriers that limit access to a community or restrict movement within a community.

Additional short-term construction related impacts could result from disturbances due to construction equipment; these impacts are discussed under other impact categories (e.g., Noise, Aesthetics, and Air Quality). Long-term impacts could result from the construction of new or expanded roadways or transit facilities in existing communities. For example, the widening of a roadway could be perceived as too great a distance to cross by a pedestrian, thereby dividing a community. An elevated grade crossing may create a physical barrier in some locations. Impacts would most likely occur in urbanized or urbanizing parts of the region, although urban areas would be unlikely to be impacted by new or expanded roadways (as these areas are already developed and have little available land to expand roadways). New transit facilities are often planned in areas that have existing communities and although they often create a community benefit by reducing congestion in the area, connecting communities, and providing a new mode of travel or relieving overcrowding on an existing mode of travel; new transit track and expanded transit facilities for light rail, heavy rail or Metrolink all have the potential to disrupt or divide established communities.

The addition of new lanes to existing freeway routes also has the potential to divide a community. As overcrossings and under-crossings associated with the freeway routes are widened, it can create a real or perceived barrier to pedestrians, bicyclists and motorists. New freeway segments that occur in rural areas would have the least potential to divide established communities. Rural areas do not typically have the same degree of established communities as urban areas; however, the potential for impacts still exists.

SCAG used GIS data to analyze where major freeway, rail, and transit projects in the 2012-2035 RTP/SCS intersect residential areas. For purposes of identifying potential land use incompatibility a 150-foot potential impact zone was drawn around the freeway, rail, and transit projects in the 2012-2035 RTP/SCS to identify the number of acres potentially affected (air quality and noise impacts extend further and are addressed in Sections 3.2 Air Quality and 3.9 Noise). See **Table 3.8-1** for residential and business land uses within 150 feet of Plan and No Project conditions and **Table 3.8-2** for total acreage of land uses under the Plan and No Project conditions. The analysis shows that 3,236 acres of residential land uses would be located within the 150-foot radius of the freeway, transit, and freight rail projects included in the 2012-2035 RTP/SCS.

TABLE 3.8-1: RESIDENTIAL AND BUSINESS LAND USES WITHIN 150-FOOT RADIUS OF PLAN PROJECTS

Land Use	No Project (Acres)	Plan (Acres)
RESIDENTIAL		
Low Density Residential	255.83	1,993.22
Medium to High Density Residential	97.13	1,048.38
Rural Density Residential	5.65	194.21
Residential total	**358.60**	**3,235.80**
BUSINESS		
Extraction	0.00	79.62
Commercial	266.11	3,703.80
Industrial	117.21	2,028.49
Mixed Commercial and Industrial	8.02	103.55
Mixed Urban	0.06	26.41
Business Total	**391.40**	**5,941.88**

SOURCE: SCAG GIS Analysis, 2011; SCAG Land Use, 2008.

While this PEIR analyzes land use impacts on the community as a whole, it is notable that certain communities may be affected by the growth associated with the 2012-2035 RTP/SCS, as well as by potential gentrification and associated displacement. While the SCAG region population is increasingly using transit and showing more interest in living in transit-rich neighborhoods, this favored trend is tempered by a growing concern about gentrification and displacement. Current neighborhood residents, many of them low income and/or people of color, may not benefit from planned transit investment, stations, and many other amenities that come with transit-induced neighborhood revitalization. More affluent and less diverse residents can displace them because new development near transit areas can be unaffordable. Gentrification

can divide existing communities as effectively as physical barriers.[7] As discussed above, the disruption or division of existing communities could be a significant impact. Implementation of Mitigation Measures **MM-LU11** through **MM-LU13** would reduce impacts related to dividing an established community; however, impacts would remain significant.

Impact 3.8-3: Potential to result in substantial disturbance and/or loss of forestlands, prime farmlands and/or grazing lands, throughout the six-county SCAG region.

Implementation of the 2012-2035 RTP/SCS could result in long-term impacts to agricultural or forest lands in the region, by adding transportation infrastructure to parts of the region that currently serve as agricultural lands or through development on agricultural lands. **Map 3.8-3** and **Map 3.8-1** show the general distribution of agricultural lands in the six-county SCAG region. These areas are interspersed throughout urban areas and are also located in less developed portions of the counties. Where there would be new facilities constructed outside of the urbanized areas, undisturbed/vacant land could be utilized for transportation purposes, additionally development associated with new urban uses could also be located on agricultural or forest lands. Such lands may have historically been farmed or may currently be used for agriculture, including lands currently under Williamson Act contracts, as well as potentially forest or timber lands. Projects that are most likely to result in significant impacts to agricultural lands include highway expansion and potential connectors. For example, the High Desert Corridor project could result in the consumption of grazing and unique prime farmlands. The mixed flow, Express/HOT lane project along SR-395 could also consume grazing land. Additional projects such as roadway improvements, toll road improvements and connections, grade separated facilities for busways, goods movement roadway facilities, and HOV/HOT connectors in areas that currently serve as agricultural could also result in significant impacts.

In addition to impacts from transportation projects included in the Plan, anticipated development associated with the Plan could also result in the consumption of agricultural lands and forestlands. Although the Plan would target development in urbanized areas (primarily the HQTAs), some development is anticipated to occur on areas that are currently in use as agricultural lands. This would be a significant impact.

The loss and disturbance of agricultural lands would be significant. Implementation of Mitigation Measures **MM-LU14** through **MM-LU35** would reduce impacts related to disturbance and/or loss of prime farmlands and/or grazing lands; however, impacts would remain significant.

Impact 3.8-4: Potential to influence the pattern of urbanization in the region such that land use incompatibilities could occur.

Implementation of the 2012-2035 RTP/SCS would affect a number of land uses. In general, land uses within 150 feet of transportation improvements could experience some kind of land use impact (as noted above noise and air quality impacts would extend beyond this distance); commercial and industrial uses are less sensitive to transportation projects. **Table 3.8-2,** shows the estimated acreage of different land use categories that occur within 150 feet of either side of the proposed transportation project alignments included in the Plan and the No Project Alternative. Under both the Plan and the No Project Alternative impacts could occur. In addition to these direct impacts on land use, the total vacant land that is expected to be consumed under the 2012-2035 RTP/SCS is estimated to be approximately 334 square miles or 213,800 acres compared to up to 742 square miles or 474,900 acres under the No Project Alternative.

[7]This issue is addressed in the 2012-2035 RTP/SCS Environmental Justice Appendix (page 83).

TABLE 3.8-2: LAND USES AFFECTED BY PLAN PROJECTS		
Land Use	**No Project (acres)**	**2012-2035 RTP/SCS (acres)**
Commercial	266	3,704
Extraction	0	80
Industrial	117	2,028
Medium to High Residential	97	1,048
Mixed Commercial and Industrial	8	104
Open Space and Recreation	185	733
Transportation, Communications, and Utilities	1,869	3,913
Undevelopable	161	4
Vacant	953	9,188
Water	0	78
SCAG Region	3,657	20,879
SOURCE: SCAG GIS Analysis, 2011; SCAG Land Use, 2008		

The 2012-2035 RTP/SCS includes policies that would influence the distribution of the growing population. The land use measures included in the 2012-2035 RTP/SCS would encourage use of underutilized urban land, and in some cases would help increase the intensity of the use to achieve mobility and other benefits. However, stable single-family neighborhoods would be protected, regardless of whether or not they were built at the maximum allowable density, as indicated by general plans.

Implementation of the innovative strategies in the 2012-2035 RTP/SCS could result in changes in land uses by changing concentrations of development throughout the six-county region. Implementation of Mitigation Measures **MM-LU36** through **MM-LU85** would reduce land use impacts; however, potential for significant incompatibilities with transportation projects and anticipated development remain.

Cumulative Impact 3.8-5: Potential to change patterns of growth beyond the SCAG region.

Implementation of the 2012-2035 RTP/SCS would result in an increase in density and land use development over the next 25 years. By 2035, the SCAG region is anticipated to add an additional 3.9 million people with or without the 2012-2035 RTP/SCS. The improved accessibility from the 2012-2035 RTP/SCS could help facilitate urbanization to areas outside the region. Changes in the land use patterns in the region, for example through the conversion of agricultural land has the potential to set a precedent that could affect areas outside the region resulting in the conversion of agricultural lands or increased urbanization in other areas as well. Implementation of Mitigation Measures **MM-LU1** through **MM-LU85** would reduce cumulative impacts; however, the impacts would remain significant.

MITIGATION MEASURES

Mitigation Measures **MM-LU1** through **MM-LU10**, **MM-LU21** and **MM-LU22**, **MM-LU32**, **MM-LU37**, **MM-LU 52**, **MM-LU64**, and **MM-LU74** (jointly with local jurisdictions) shall be implemented by SCAG over the lifetime of the 2012-2035 RTP/SCS. All other Land Use mitigation measures can and should be implemented by project sponsors (for both development and transportation projects) as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions.

Consistency with General Plans

MM-LU1: SCAG shall encourage cities and counties in the region to provide SCAG with electronic versions of their most recent general plan (and associated environmental document) and any updates as they are produced.

MM-LU2: SCAG shall encourage, through regional policy comments, that cities and counties update their general plans at least every ten years, as recommended by the Governor's Office of Planning and Research.

MM-LU3: SCAG shall work with its member cities and counties to ensure that transportation projects and growth are consistent with the RTP and general plans.

MM-LU4: SCAG shall coordinate with member cities and counties to encourage that general plans reflect RTP/SCS policies and strategies. SCAG will work to build consensus on how to address inconsistencies between general plans and RTP/SCS policies.

MM-LU5: SCAG shall provide technical assistance and regional leadership to implement the RTP/SCS goals and strategies and integrate growth and land use planning with the existing and planned transportation network.

MM-LU6: SCAG shall provide planning services to local jurisdictions through Compass Blueprint Demonstration Projects. These projects will help local jurisdictions:

- Update General Plans to reflect Compass Blueprint principles and integrate land use and transportation planning.
- Develop specific plans, zoning overlays and other planning tools to enable and stimulate desired land use changes that are consistent with the future land development pattern in the 2012-2035 RTP/SCS
- Complete the economic analysis and community involvement efforts that will ensure that the planned changes are market feasible and responsible to stakeholder concerns.
- Visualize potential changes, through innovative graphics and mapping technology to inform the dialogue about growth, development and transportation at the local and regional level.

MM-LU7: SCAG shall continue with a targeted public relations strategy that emphasizes regional leadership, the benefits and implications of Compass Blueprint principles and sustainable growth, and builds a sense of common interests among Southern Californians.

MM-LU8: SCAG shall use its Intergovernmental Review Process to provide review and comment on large development projects regarding their consistency with the RTP and other regional planning efforts.

MM-LU9: SCAG shall develop and implement coordinated mitigation programs for regional projects, with an emphasis on regional transportation projects.

MM-LU10: Local jurisdictions can and should provide for new housing consistent with the regional Housing Needs Assessment (RHNA) to accommodate their share of the forecasted regional growth.

Division of Communities

MM-LU11: Significant adverse impacts to community cohesion resulting from the displacement of residences or businesses can and should be mitigated with specific relocation measures as dictated by local, state or federal requirements on a project-by project basis. Such measures include assistance in finding a new location, assistance with moving, or compensation for losses. Where it has been determined that displacement is necessary and displaced individuals are eligible, a relocation assistance program consistent with the State Uniform Location Assistance and Real Properties Acquisition Policies Act provides compensation and assistance in finding new residence for displaced individuals.

MM-LU12: Project sponsors can and should design new transportation facilities that consider access to existing community facilities. During the design phase of the project, community amenities and facilities can and should be identified and considered in the design of the project.

MM-LU13: Project sponsors can and should design roadway improvements that minimize barriers to pedestrians and bicyclists. During the design phase, pedestrian and bicycle routes should be determined that permit connections to nearby community facilities.

Loss of Farmland and Forest Lands

MM-LU14: For projects that require approval or funding by the USDOT, project sponsors can and should comply with Section 4(f) U.S. Department of Transportation Act of 1966 (U.S. DOT Act).

MM-LU15: Project sponsors can and should ensure that at least one acre of unprotected open space is permanently conserved for each acre of open space developed as a result of transportation projects/improvements.

MM-LU16: Local jurisdictions can and should seek funding to prepare specific plans and related environmental documents to facilitate mixed-use development at selected sites, and to allow these areas to serve as receiver sites for transfer of development rights away from environmentally sensitive lands and rural areas outside established urban growth boundaries.

MM-LU17: Local jurisdictions can and should preserve and create open space and parks. Preserve existing trees, and plant replacement trees at a set ratio.

MM-LU18: Project sponsors can and should consider corridor realignment, buffer zones and setbacks, and berms and fencing where feasible, to avoid agricultural lands and to reduce conflicts between transportation uses and agricultural lands.

MM-LU19: Prior to final approval of each project and when feasible and prudent, the project sponsor can and should establish conservation easement programs to mitigate impacts to prime farmland.

MM-LU20: Prior to final approval of each project, the project sponsor can and should to the extent practical and feasible, avoid impacts to prime farmlands or farmlands that support crops considered valuable to the local or regional economy.

MM-LU21: SCAG shall use its intergovernmental review (IGR) process to review projects with potentially significant impacts to important farmlands and recommend impact avoidance and mitigation measures.

MM-LU22: SCAG shall work with member agencies and the region's farmland interests to develop regional guidelines for buffering farmland from urban encroachment, resolving conflicts that prevent farming on hillsides and other designated areas, and closing loopholes that allow conversion of non-farm uses without a grading permit.

MM-LU23: Local jurisdictions can and should establish programs to direct growth to less agriculturally valuable lands and ensure, where possible, the continued protection of the most agriculturally valuable land within each county. The following are offered as examples of programs:

- The development or participation in transfer of development rights programs to encourage the preservation of agricultural lands.

- Tools for the preservation of agricultural lands such as eliminating estates and ranchettes and clustering to retain productive agricultural land.
- Easing restrictions on farmer's markets and encourage cooperative farming initiatives to increase the availability of locally grown food.
- Considering partnering with school districts to develop farm-to-school programs

MM-LU24: Local jurisdictions can and should avoid the premature conversion of farmlands by promoting infill development and the continuation of agricultural uses until urban development is imminent; if development of agricultural lands is necessary, growth can and should be directed to those lands on which the continued viability of agricultural production has been compromised by surrounding urban development on the loss of local markets.

MM-LU25: Local jurisdictions can and should encourage patterns of urban development and land use, which reduce costs on infrastructure and make better use of existing facilities. Strategies local jurisdictions can and should pursue include:

- Increase the accessibility to natural areas lands for outdoor recreation.
- Promote infill development and redevelopment to revitalize existing communities
- Utilize "green" development techniques
- Promote water-efficient land use and development.

MM-LU26: Project sponsors and local jurisdictions can and should promote infill development and redevelopment to encourage the efficient use of land and minimize the development of agricultural and open space lands.

MM-LU27: Local jurisdictions can and should consider the following land use principles that use resources efficiently, and to the extent practical and feasible minimize pollution and reduce waste generation:

- Mixed-use residential and commercial development that is connected with public transportation and utilizes existing infrastructure
- Land use and planning strategies to increase biking and walking trips.

MM-LU28: Individual projects must be consistent with federal, state, and local policies that preserve agricultural lands and support the economic viability of agricultural activities, as well as policies that provide compensation for property owners if preservation is not feasible.

MM-LU29: For projects in agricultural areas, project sponsors can and should contact the California Department of Conservation and each county's Agricultural Commissioner's office to identify the location of prime farmlands and lands that support crops considered valuable to the local or regional economy. Impacts to such lands can and should be evaluated in project-specific environmental documents. The analysis can and should use the land evaluation and site assessment (LESA) analysis method (CEQA Guidelines §21095), as appropriate. The project sponsors or local jurisdictions can and should be responsible for ensuring adherence to the mitigation measures prior to construction. Mitigation measures may include conservation easements or the payment of in-lieu fees.

MM-LU30: For those projects that require federal funding, the federal agency evaluates the effects of the action to agricultural resources using the criteria set forth in the Farmland Protection Policy Act (FPPA). The FPPA is administered by the NRCS, which determines impacts to farmland that could occur due to the proposed project. The determination is made through coordination between the federal agency proposing or supporting the project and NRCS. The

assessment of potential impacts to farmland from corridor type projects, which is typical of transportation projects analyzed in this PEIR, will require completion of Form NRCS-CPA-106, Farmland Conservation Impact Rating for Corridor Type Projects. NRCS will make a determination, using set thresholds, as to whether additional project specific mitigation would be required.

MM-LU31: Prior to final approval of each project, the project sponsor can and should encourage enrollments of agricultural lands for counties that have Williamson Act programs, where applicable.

MM-LU32: SCAG shall support policies that preserve and promote the productivity and viability of agricultural lands, including promoting the availability of locally grown and organic food in the region.

MM-LU33: Project sponsors and local jurisdictions can and should submit for IGR review projects with potentially significant impacts to important farmlands. Projects can and should include mitigation measures to reduce impacts and demonstrate project alternatives that avoid or lessen impact to agricultural lands. Mitigation can and should occur at a 1:1 ratio.

MM-LU34: Preserve forested areas, agricultural lands, wildlife habitat and corridors, wetlands, watersheds, groundwater recharge areas and other open space that provide carbon sequestration benefits.

MM-LU35: Require best management practices in agriculture and animal operations to reduce emissions, conserve energy and water, and utilize alternative energy sources, including biogas, wind and solar.

Land Use Incompatibility

MM-LU36: Local jurisdictions can and should encourage patterns of urban development and land use, which reduce costs on infrastructure and make better use of existing facilities.

MM-LU37: SCAG's Compass Blueprint program and other ongoing regional planning efforts will be used to build a consensus in the region to support changes in land use to accommodate future population growth while maintaining the quality of life in the region.

MM-LU38: Local jurisdictions can and should adopt and implement General Plan Housing Elements that accommodate the housing need identified through the RHNA process. Affordable housing can and should be provided consistent with the RHNA income category distribution adopted for each jurisdiction.

MM-LU39: Local jurisdictions can and should consider shared regional priorities, as outlined in the Compass Blueprint, 2012-2035 RTP/SCS and other ongoing regional planning efforts, in determining their own development goals and drafting local plans.

MM-LU40: Local jurisdictions and subregional organizations can and should encourage the cleanup and redevelopment of brownfield sites.

MM-LU41: Local jurisdictions or agencies can and should adopt and implement a development pattern that utilizes existing infrastructure; reduces the need for new roads, utilities and other public works in new growth areas; and enhances non-automobile transportation.

MM-LU42: Local jurisdictions or agencies can and should establish an urban growth boundary (UBG) with related ordinances or programs to limit suburban sprawl; local jurisdictions or agencies can and should restrict urban development beyond the UGB and streamline entitlement processes within the UGB for consistent projects.

MM-LU43: Urban development can and should occur only where urban public facilities and services exist or can be reasonably made available.

MM-LU44: The improvement and expansion of one urban public facility or service can and should not stimulate development that significantly precedes the local jurisdiction's ability to provide all other necessary urban public facilities and services at adequate levels.

MM-LU45: Local jurisdictions can and should redirect new growth into existing city/urban reserve areas

MM-LU46: Local jurisdictions can and should maintain a one dwelling unit per 10-acre minimum lot size or lower density in areas outside designated urban service lines.

MM-LU47: Local jurisdictions can and should encourage high-density, mixed-use, infill development and creative reuse of brownfield, under-utilized and/or defunct properties within the urban core.

MM-LU48: Local jurisdictions can and should increase densities in urban core areas to support public transit.

MM-LU49: Local jurisdictions can and should remove barriers to the development of accessory dwelling units in existing residential neighborhoods as appropriate

MM-LU50: Local jurisdictions can and should reduce required road width standards wherever feasible to calm traffic and encourage alternative modes of transportation.

MM-LU51: Local jurisdictions can and should reduce parking space requirements, unbundle parking from rents and charge for parking in new developments.

MM-LU52: Local jurisdictions can and should add bicycle facilities to streets and public spaces.

MM-LU53: SCAG shall promote infill, mixed-use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones.

MM-LU54: Local jurisdictions can and should plan for and create incentives for mixed-use development.

MM-LU55: Local jurisdictions can and should identify sites suitable for mixed-use development and establish appropriate site-specific standards to accommodate the mixed uses. Site-specific standards could include:

- Increasing allowable building height or allowing height limit bonuses;
- Allowing flexibility in applying development standards (such as FAR2 and lot coverage) based on the location, type, and size of the units, and the design of the development;
- Allowing the residential component to be additive rather than within the established FAR for that zone, and eliminating maximum density requirements for residential uses in mixed use zones;

- Allowing reduced and shared parking based on the use mix, and establishing parking maximums where sites are located within 0.25 miles of a public transit stop;
- Allowing for tandem parking, shared parking and off-site parking leases;
- Requiring all property owners in mixed-use areas to unbundle parking from commercial and residential leases;
- Creating parking benefit districts, which invest meter revenues in pedestrian infrastructure and other public amenities;
- Establishing performance pricing of street parking, so that it is expensive enough to promote frequent turnover and keep 15 percent of spaces empty at all times.

MM-LU56: Local jurisdictions can and should enable prototype mixed-use structures for use in neighborhood center zones that can be adapted to new uses over time with minimal internal remodeling.

MM-LU57: Local jurisdictions can and should identify and facilitate the inclusion of complementary land uses not already present in local zoning districts, such as supermarkets, parks and recreational fields, schools in neighborhoods, and residential uses in business districts, to reduce the vehicle miles traveled and promote bicycling and walking to these uses.

MM-LU58: Local jurisdictions can and should work with employers developing larger projects to ensure local housing opportunities for their employees, and engage employers to find ways to provide housing assistance as part of their employee benefits packages; major projects in mixed-use areas can and should include work-force housing where feasible.

MM-LU59: Local jurisdictions can and should revise zoning ordinance(s) to allow local-serving businesses, such as childcare centers, restaurants, banks, family medical offices, drug stores, and other similar services near employment centers to minimize midday vehicle use.

MM-LU60: Local jurisdictions can and should develop form-based community design standards to be applied to development projects and land use plans, using a comprehensive community outreach, for areas designated mixed-use.

MM-LU61: Local jurisdictions can and should mix affordable housing units with market rate units as opposed to building segregated affordable housing developments.

MM-LU62: Where practical and feasible, local jurisdictions can and should develop programs that enable the reuse of underutilized commercial, office and/or industrial properties for housing or mixed-use housing.

MM-LU63: Local jurisdictions can and should ensure consistency with “smart growth” principles – mixed-use, infill, and higher density projects that provide alternatives to individual vehicle travel and promote the efficient delivery of services and goods.

MM-LU64: Local jurisdictions can and should meet recognized “smart growth” benchmarks.

MM-LU65: SCAG shall educate the public about the many benefits of well-designed, higher density development.

MM-LU66: Project sponsors can and should incorporate public transit into the project’s design.

MM-LU67: Project sponsors can and should include pedestrian and bicycle facilities within projects and ensure that existing non-motorized routes are maintained and enhanced.

MM-LU68: Local jurisdictions can and should encourage residential development in High Quality Transit Areas (HQTAs). Such development can and should include a generally a walkable transit village that has a minimum density of 20 dwelling units per acre and is within a 0.5 miles of a well-serviced transit stop, and includes transit corridors with minimum 15-minute or less service frequency during peak commute hours.

MM-LU69: Local jurisdictions can and should promote greater linkage between land uses and transit, as well as other modes of transportation.

MM-LU70: Local jurisdictions can and should ensure new development is designed to make public transit a viable choice for residents, including:

- Locating medium-high density development near activity centers that can be served efficiently by public transit and alternative transportation modes;
- Locating medium-high density development near streets served by public transit whenever feasible;
- Linking neighborhoods to bus stops by continuous sidewalks or pedestrian paths.

MM-LU71: Local jurisdictions can and should establish city-centered corridors, directing development to existing transportation corridors.

MM-LU72: Local jurisdictions can and should develop form-based community design standards to be applied to development projects and land use plans, using a comprehensive community outreach program, for areas designated mixed-use

MM-LU73: Local jurisdictions can and should locate affordable housing in transit-oriented development whenever feasible

MM-LU74: Local jurisdictions can and should consider jobs/housing balance, to the extent practical and feasible, and encourage the development of communities where people live closer to work, bike, walk, and take transit as a substitute for personal auto travel.

MM-LU75: SCAG and local jurisdictions shall minimize public expenditure for infrastructure and facilities to support urban type land uses in areas where public health and safety could not be guaranteed.

MM-LU76: Project sponsors can and should consider community cohesion in designing projects through communities. Transit facilities should be designed to integrate with the community and encourage walking and bicycling as well as park and ride. New or widened roadways (and freeways) should be designed to minimize impacts to the extent feasible through landscaping, pedestrian furniture as appropriate. New roadways or freeways should consider feasible innovative designs such as cap parks that maintain community cohesion.

MM-LU77: Local jurisdictions can and should promote development and preservation of neighborhood characteristics that encourage walking and bicycle riding in lieu of automobile-based travel.

MM-LU78: Local jurisdictions can and should create and preserve distinct, identifiable neighborhoods whose characteristics support pedestrian travel, especially within, but not limited to, mixed-use and transit-oriented development areas, including:

- Designing or maintaining neighborhoods where the neighborhood center can be reached in approximately five minutes of walking;
- Increasing housing densities from the perimeter to the center of the neighborhood;
- Directing retail, commercial, and office space to the center of the neighborhood;
- Encouraging pedestrian-only streets and/or plazas within developments, and destinations that may be reached conveniently by public transportation, walking, or bicycling;
- Allowing flexible parking strategies in neighborhood activity centers to foster a pedestrian-oriented streetscape;
- Providing continuous sidewalks with shade trees and landscape strips to separate pedestrians from traffic;
- Encouraging neighborhood parks and recreational centers near concentrations of residential areas (preferably within one quarter mile) and include pedestrian walkways and bicycle paths that encourage non-motorized travel.

MM-LU79: Local jurisdictions can and should ensure pedestrian access to activities and services, especially within, but not limited to, mixed-use and transit-oriented development areas, including:

- Ensuring new development that provides pedestrian connections in as many locations as possible to adjacent development, arterial streets, thoroughfares;
- Ensuring a balanced mix of housing, workplaces, shopping, recreational opportunities, and institutional uses, including mixed-use structures;
- Locating schools in neighborhoods, within safe and easy walking distances of residences served;
- For new development, primary entrances shall be pedestrian entrances, with automobile entrances and parking located to the rear;
- Support development where automobile access to buildings does not impede pedestrian access, by consolidating driveways between buildings or developing alley access;
- Street parking provided shall be utilized as a buffer between sidewalk pedestrian traffic and the automobile portion of the roadway;
- Establish pedestrian and bicycle connectivity standards for new development, with block sizes between 1 and 2 acres;
- For existing areas that do not meet established connectivity standards, prioritize the physical development of pedestrian connectors;
- Prioritizing grade-separated bicycle / pedestrian crossings where appropriate to enhance connectivity or overcome barriers such as freeways, railways and waterways.

MM-LU80: Local jurisdictions can and should review fee structures and other opportunities to provide financial and administrative incentives to support desired land uses, development patterns, and alternative modes of transportation.

MM-LU81: Local jurisdictions can and should promote desired land uses by scaling developer fees based on desired criteria, for example:

- Increasing or reducing fees proportionally with distance from the city center or preferred transit sites;
- Increasing or reducing fees based on the degree to which mixed uses are incorporated into the project;
- Reducing fees for creative re-use of brownfield sites;
- Increasing fees for the use of greenfield sites.

MM-LU82: Local jurisdictions can and should provide fast-track permitting and reductions in processing fees for desired projects. Local jurisdictions can and should research and implement a program of incentives for development projects that are fully consistent with the 2012-2035 RTP/SCS.

MM-LU83: Local jurisdictions can and should provide incentive funding and/or infrastructure loans to support desired projects.

MM-LU84: Local jurisdictions can and should give preference for infrastructure improvements that support or enhance desired land uses and projects.

MM-LU85: Local jurisdictions can and should reduce heat gain from pavement and other hardscaping, including:

- Reduce street rights-of-way and pavement widths to pre-World War II widths (typically 22 to 34 feet for local streets, and 30 to 35 feet for collector streets, curb to curb), unless landscape medians or parkway strips are allowed in the center of roadways;
- Reinstate the use of parkway strips to allow shading of streets by trees;
- Include shade trees on south- and west-facing sides of structures;
- Include low-water landscaping in place of hardscaping around transportation infrastructure and in parking areas;
- Install cool roofs, green roofs, and use cool paving for pathways, parking, and other roadway surfaces;
- Establish standards that provide for pervious pavement options:
  - Remove obstacles to xeriscaping, edible landscaping and low-water landscaping.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Consistency with Currently Applicable Adopted Local Land Use Plans and Policies

It is likely that in some instances currently adopted general plans and adopted plans will be inconsistent with RTP policies. This impact would remain significant after the implementation of Mitigation Measures **MM-LU1** through **MM-LU10**.

Division of a Community

The 2012-2035 RTP/SCS proposes projects that have the potential to disrupt or divide communities and, considering the scale and number of these projects, even with mitigation, it is likely that in some cases impacts will not be mitigated to a less than significant level. This impact would remain significant after the implementation of Mitigation Measures **MM-LU11** through **MM-LU13**

Forest Lands, Agricultural and Farm Lands

It is anticipated that impacts to forest and agricultural land would not be able to be mitigated in every instance. Therefore, this impact would remain significant. This impact would remain significant after the implementation of Mitigation Measures **MM-LU14** through **MM-LU35.**

Land Use Compatibility

The 2012-2035 RTP/SCS through transportation investments and development patterns would influence the pattern of urbanization in the region. Even with mitigation, it is likely that this impact would remain significant. This impact would remain significant after the implementation of Mitigation Measures **MM-LU36** through **MM-LU85.**

Cumulative Impacts

Implementation of Mitigation Measures **MM-LU1** through **MM-LU85** would reduce cumulative land use impacts. However, this impact would remain significant.

COMPARISION WITH THE NO PROJECT ALTERNATIVE

In the No Project Alternative, the population of the SCAG region would still grow by about 3.9 million people, however no regional transportation investments would be made above the existing programmed projects and no land use strategies would be in place. The population distribution would follow past trends, uninfluenced by additional transportation investments.

Direct Impacts

The No Project Alternative includes fewer transportation projects than the 2012-2035 RTP/SCS and does not include any land use strategies. It would have a lesser potential for conflicting with general plans as the only growth strategies that would occur would be local land use controls. It also would have less of an influence on the patterns of urbanization in the region. Nonetheless, urbanization with significant potential for land use incompatibility would occur. The No Project Alternative would result in a more dispersed land use pattern. The No Project Alternative would consume an estimated 742 square miles of open space/ vacant land, while the Plan would consume only 334 square miles of open space/vacant land. Therefore, the No Project Alternative would have greater impacts related to conversion of farmland and agricultural lands. The No Project Alternative would likely have similar or possibly greater impact on land use incompatibility because redevelopment in existing communities would still occur and more land in general would be impacted.

The No Project Alternative contains fewer transportation investments than the Plan Alternative. Consequently, there would be fewer places where businesses and homes would be displaced by transportation projects and fewer places where communities would be disrupted. As shown in Table 3.8-1, the No Project Alternative would occur within 150 feet of 391 acres of business land uses (commercial, industrial and extraction land uses) and 359 acres of residential land uses (rural, low, and medium to high density housing land uses). For the Plan 5,942 acres of business land uses and about 3,236 acres of residential land uses would be affected by transportation projects. **The impacts of transportation projects alone under the Plan would result in greater impacts as compared to the No Project Alternative for Impacts 3.8-1, 3.8-2 and 3.8-3. Development impacts are less clear, since under the Plan development would be concentrated in urban areas. In contrast, in the No Project Alternative land uses would change to a much greater extent in undeveloped areas.**

Cumulative Effects

The No Project Alternative is expected to accommodate the same increase in total population as the proposed Plan. However, the Plan includes land use measures that would help reduce the consumption and disturbance of agricultural lands, vacant lands, open space, and recreation lands. These policies and mitigation strategies are absent in the No Project Alternative. Under the No Project Alternative, up to

approximately 742 square miles or 474,900 acres of vacant, open space and agricultural lands would be consumed, compared 334 square miles or 213,800 acres under the Plan. The more dispersed land use pattern of the No Project Alternative would consume more vacant land, but also could impact areas outside the region through setting a precedent for the conversion of non-urban lands. This would happen as development spreads out along existing freeways or similar methods of expansion. **Under the No Project Alternative land use changes could affect jurisdictions outside the SCAG region, by setting a precedent for and/or inducing consumption of agricultural lands; such impacts would be cumulatively considerable. The Plan would decrease congestion potentially making it easier for people to live and work outside the region, thereby inducing land uses changes outside the region, these impacts also could be cumulatively considerable.**

3.9 NOISE

This section describes the current noise and vibration levels of the SCAG region, discusses the potential construction and operational impacts of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategies (2013-2035 RTP/SCS or Plan), identifies mitigation measures for the impacts, and evaluates the residual impacts. Topics addressed include short-term construction and long-term operational noise and groundborne vibration. The following background information provides noise and vibration characteristics and effects.

Noise Characteristics and Effects

Characteristics of Sound. Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement for sound is the decibel (dB). The human ear is not equally sensitive to sound at all frequencies. The "A-weighted scale," abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. On this scale, the range of human hearing extends from approximately 3 to 140 dBA. **Figure 3.9-1** provides examples of A-weighted noise levels from common sounds.

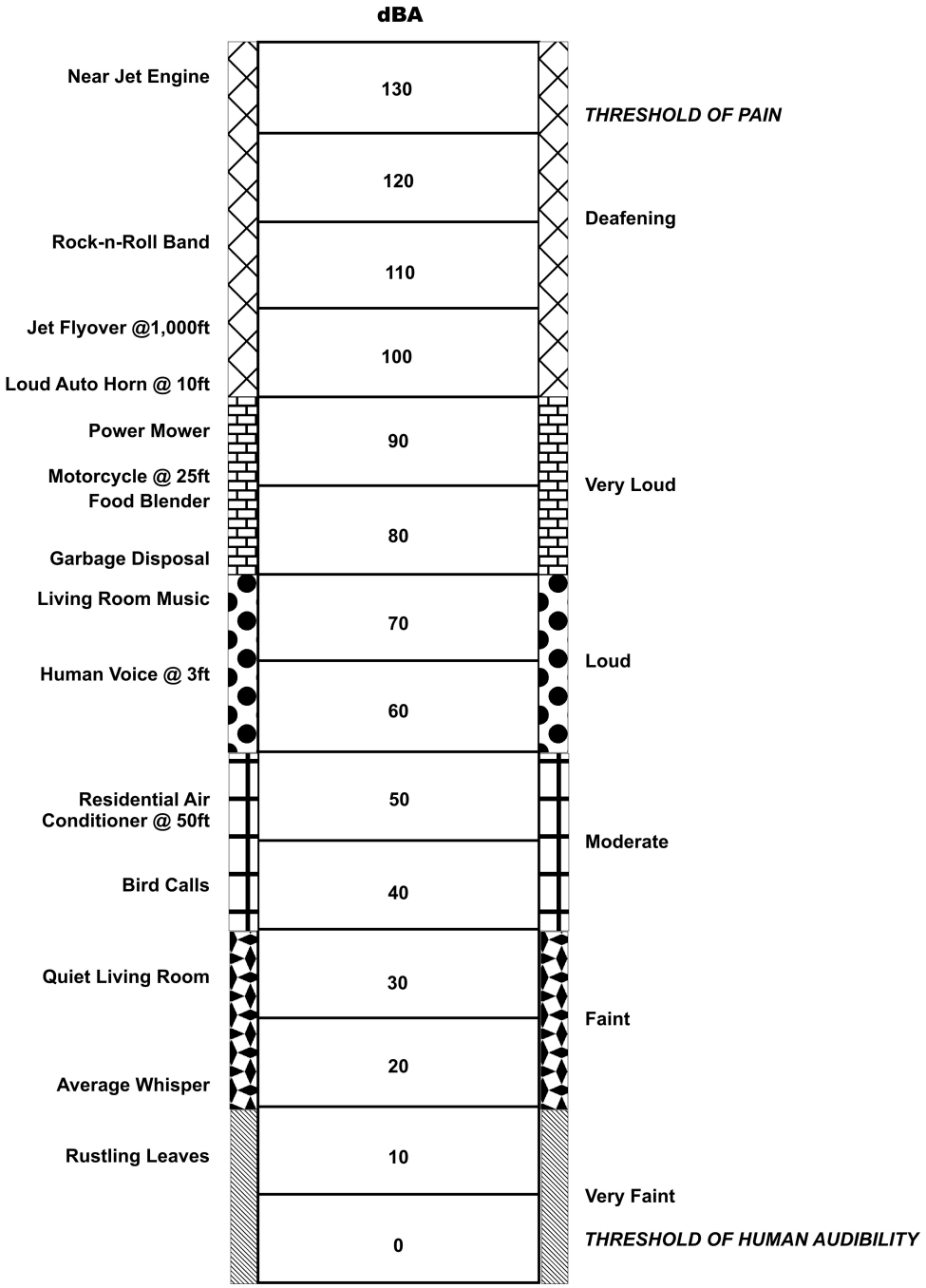
Noise Definitions. Environmental noise levels typically fluctuate across time of day; different types of noise descriptors are used to account for this variability, and different types of descriptors have been developed to differentiate between cumulative noise over a given period and single noise events. Cumulative noise descriptors include the energy-equivalent noise level (L_{eq}), Day-Night Average Noise Level (DNL), and Community Noise Equivalent Level (CNEL). The L_{eq} is the actual time-averaged, equivalent steady-state sound level, which, in a stated period, contains the same acoustic energy as the time-varying sound level during the same period. DNL and CNEL values result from the averaging of L_{eq} values (based on A-weighted decibels) over a 24-hour period, with weighting factors applied to different periods of the day and night to account for their perceived relative annoyance. For DNL, noise that occurs during the nighttime period (10:00 p.m. to 7:00 a.m.) is "penalized" by 10 dB. CNEL is similar to DNL, except that it also includes a "penalty" of approximately 5 dB for noise that occurs during the evening period (7:00 p.m. to 10:00 p.m.).

Individual noise events, such as train pass-bys or aircraft over-flights, are further described using single-event and cumulative noise descriptors. For single events, the maximum measured noise level (Lmax) is often cited, as is the Sound Exposure Level (SEL). The SEL is the energy-based sum of a noise event of given duration that has been "squeezed" into a reference duration of one second, and is typically a value five to ten dB higher than the Lmax.

Effects of Noise. Noise is generally defined as unwanted sound. The degree to which noise can impact the human environment range from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual response include the intensity, frequency, and pattern of noise, the amount of background noise present before the intruding noise, and the nature of work or human activity that is exposed to the noise source.

Audible Noise Changes. Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 dBA. A change of at least 5 dBA would be noticeable and would likely evoke a community reaction. A 10-dBA increase is subjectively heard as a doubling in loudness and would cause a community response.

Figure 3.9-1: A-Weighted Decibel Scale



SOURCE: Cowan, James P., *Handbook of Environmental Acoustics*

Noise levels decrease as the distance from the noise source to the receiver increases. Noise generated by a stationary noise source, or "point source," will decrease by approximately 6 dBA over hard surfaces (e.g., reflective surfaces such as parking lots or smooth bodies of water) and 7.5 dBA over soft surfaces (e.g., absorptive surfaces such as soft dirt, grass, or scattered bushes and trees) for each doubling of the distance. For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level would be 83 dBA at a distance of 100 feet from the noise source, 77 dBA at a distance of 200 feet, and so on. Noise generated by a mobile source will decrease by approximately 3 dBA over hard surfaces and 4.8 dBA over soft surfaces for each doubling of the distance.

Generally, noise is most audible when traveling by direct line-of-sight. Barriers, such as walls, berms, or buildings, that break the line-of-sight between the source and the receiver greatly reduce noise levels from the source since sound can only reach the receiver by bending over the top of the barrier. Sound barriers can reduce sound levels by up to 20 dBA. However, if a barrier is not high or long enough to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced.

Decibels are logarithmic units. Two decibel levels cannot be added by ordinary arithmetic means. If one automobile produces a 70-dB noise level when it passes an observer, two cars passing simultaneously would not produce 140 dB. They would combine to produce a 73-dB noise level. As an example, consider a receptor located near the interchange of two freeways. One freeway generates a 72-dBA noise level and the other freeway generates a 66-dBA noise levels. The combined noise exposure from the freeways would be 73 dBA. Another example is a receptor located near a freeway and underneath an airport flight path. The noise levels at a receptor could be 75 dBA from aircraft noise and 72 dBA from freeway noise. The combined noise level from aircraft and freeway noise exposure would be 77 dBA.

Vibration Characteristics and Effects

Characteristics of Vibration. Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of vibration are trains, buses on rough roads, and construction activities, such as blasting, pile driving, and heavy earth-moving equipment.

Vibration Definitions. There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (Vdb) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration.[1]

Effects of Vibration. High levels of vibration may cause physical personal injury or damage to buildings. However, groundborne vibration levels rarely affect human health. Instead, most people consider groundborne vibration to be an annoyance that can affect concentration or disturb sleep. In addition, high levels of groundborne vibration can damage fragile buildings or interfere with equipment that is highly sensitive to groundborne vibration (e.g., electron microscopes).

Perceptible Vibration Changes. In contrast to noise, groundborne vibration is not a phenomenon that most people experience every day. The background vibration velocity level in residential areas is usually 50 RMS or lower, well below the threshold of perception for humans which is around 65 RMS. Most perceptible

[1]Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

REGULATORY FRAMEWORK

Noise

The federal government sets noise standards for transportation-related noise sources that are closely linked to interstate commerce, such as aircraft, locomotives, and trucks, and, for those noise sources, the State government is preempted from establishing more stringent standards.

The State sets noise standards for those transportation noise sources that are not preempted from regulation, such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and general plan policies.

Federal

Federal Highway Administration (FHWA). 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.

Federal regulations also 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 must be considered for 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 Noise Abatement Criteria (NAC).

Title 23 of the Code of Federal Regulations (23 CFR § 772) provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. Under 23 CFR § 772.7, projects are categorized as Type I or Type II 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, as well as those that 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, and of noise impacts for which no apparent solution is available.

Traffic noise impacts, as defined in 23 CFR § 772.5, occur when the predicted noise level in the design year approaches or exceeds the NAC specified in 23 CFR § 772, or a predicted noise level substantially exceeds the existing noise level (a "substantial" noise increase). Under these regulations, an impact could result unrelated to the Plan if existing noise levels already exceed the NAC. A "substantial increase" is defined as an increase in L_{eq} of 12 dB during the peak hour of traffic noise. For sensitive uses, such as residences, schools, churches, parks, and playgrounds, the NAC for interior and exterior spaces is L_{eq} 57 and 66 dB, respectively, during the peak hour of traffic noise. **Table 3.9-1** 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.

TABLE 3.9-1: NOISE ABATEMENT CRITERIA

NAC, Hourly A-Weighted Noise Level	Description of Activities
57 (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.
67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
72 (Exterior)	Developed lands, properties, or activities not included in above.
52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

SOURCE: Caltrans, *Technical Noise Supplement*, November 2009.

Federal Aviation Administration (FAA). Aircraft operated in the U.S. are subject to certain 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. Pursuant to the federal Airport Noise and Capacity Act of 1990, the FAA established a schedule for complete transition to Part 36 "Stage 3" standards by year 2000. This transition schedule applies to jet aircraft with a maximum takeoff weight in excess of 75,000 pounds, and thus applies to passenger and cargo airlines, but not to operators of business jets or other general aviation aircraft.

Although the National Environmental Policy Act (NEPA) does not establish specific noise standards, the noise impacts of projects are routinely considered as one of the potential environmental consequences of federal actions subject to NEPA.

Department of Housing and Urban Development (HUD). 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 an environment's safety and comfort can be compromised by excessive noise. In order 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.

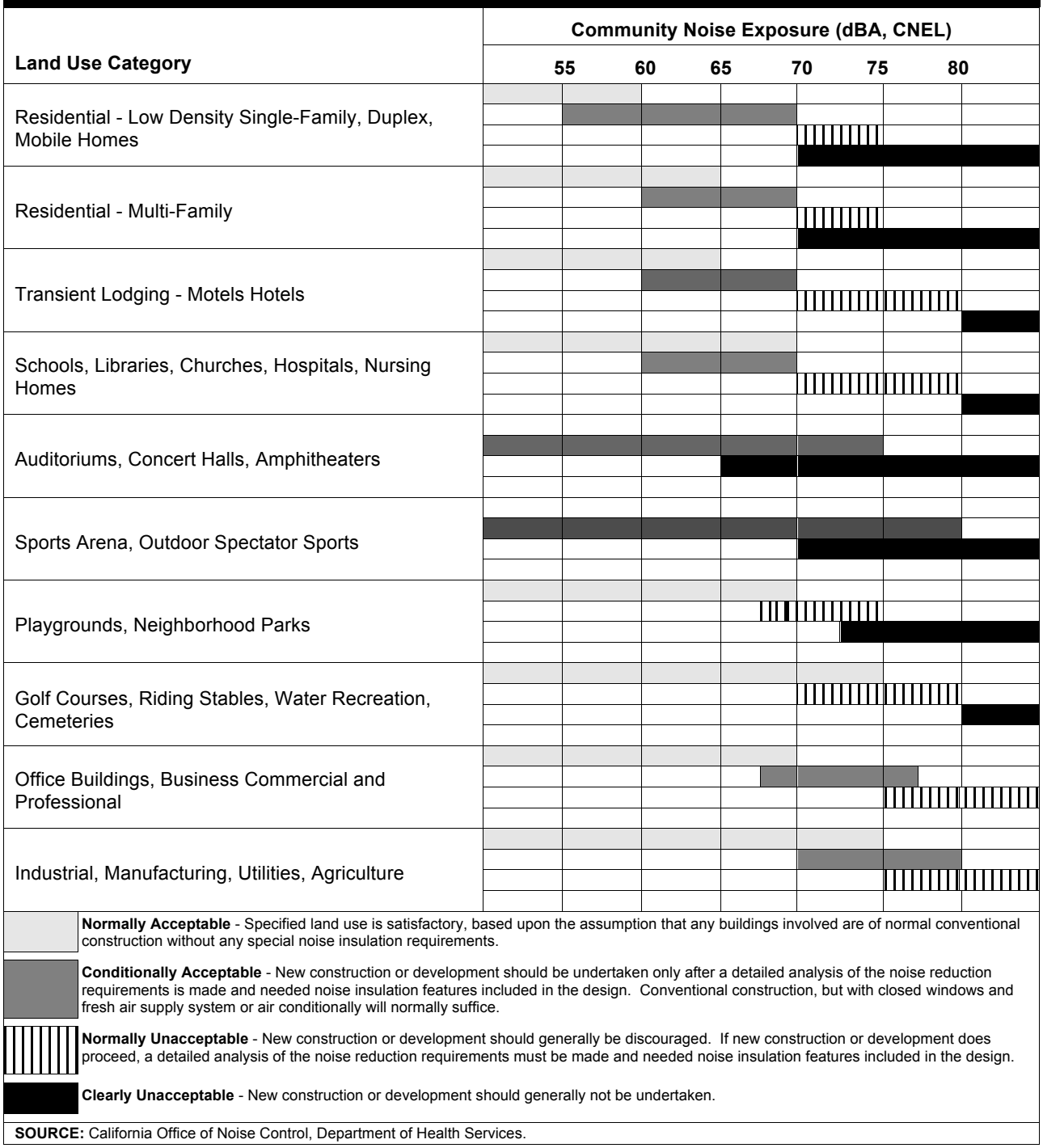
HUD's noise policy clearly requires noise attenuation measures be provided when proposed projects are to be located in high noise areas. Within the HUD Noise Assessment Guidelines, potential noise sources are examined for projects located within 15 miles of a military or civilian airport, 1,000 feet from a road or 3,000 feet from a railroad.

HUD exterior noise regulations state that 65 dBA DNL noise levels or less are acceptable for residential land uses and noise levels exceeding 75 dBA DNL are unacceptable. HUD's regulations do not contain standards for interior noise levels. Rather a goal of 45 decibels is set forth and the attenuation requirements are geared toward achieving that goal. It is assumed that with standard construction any building will provide sufficient attenuation so that if the exterior level is 65 dBA DNL or less, the interior level will be 45 dBA DNL or less.

State

California Department of Health Services. The State has published guidance for locating land uses in areas compatible with the existing noise environment. These guidelines are shown in **Table 3.9-2**. For example, it would normally be acceptable for a single-family residence to be located in an area with an existing noise level of 60 dBA CNEL or less.

TABLE 3.9-2: LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS



SOURCE: California Office of Noise Control, Department of Health Services.

California's Airport Noise Standards. The State of California has the authority to establish regulations requiring airports to address aircraft noise impacts on land uses in their vicinities. The State of California's Airport Noise Standards, found in Title 21 of the California Code of Regulations, identify a noise exposure level of CNEL 65 dB 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 the California Department of Transportation.

California Department of Transportation (Caltrans). The State of California establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State passby standard is consistent with the federal limit of 80 dB. The State passby 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 employs the Noise Abatement Criteria, discussed above in connection with FHWA.

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 L_{eq} 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 L_{eq}. If the noise levels generated from freeway and nonfreeway sources exceed 52 dBA L_{eq} 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 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 DNL 45 dB 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 DNL 60 dB.

Local

To identify, appraise, and remedy noise problems in local communities, each county and city in the SCAG region is required to adopt a noise element as part of its General Plan. 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. The overlapping DNL ranges indicate that local conditions (existing noise levels and community attitudes toward dominant noise sources) should be considered in evaluating land use compatibility at specific locations.

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). Three cities in the SCAG region, Los Angeles, Long Beach and Port Hueneme, operate port facilities. Noise from the Ports of Los Angeles, Long Beach and Hueneme are regulated by the noise ordinances and noise elements of the Los Angeles, Long Beach and Port Hueneme General Plans.

In terms of airport noise, some of the actions that airport proprietors have been allowed to take to address local community noise concerns include runway use and flight routing changes, aircraft operational procedure changes, and engine run-up restrictions. These actions generally are subject to approval by the FAA, which has the authority and responsibility to control aircraft noise sources, implement and enforce

flight operational procedures, and manage the air traffic control system. Airport proprietors may also consider limitations on airport use, but such restrictions can be overridden by the Federal Aviation Administration if it is determined that they unjustly discriminate against any user, impede the federal interest in safety and management of the air navigation system, or unreasonably interfere with interstate commerce.

Vibration

Federal

Federal Transit Administration (FTA). The FTA has published guidance relative to vibration impacts. According to the FTA, engineered concrete and masonry buildings can be exposed to groundborne vibration levels of 0.3 inches per second without experiencing structural damage. Buildings extremely susceptible to vibration damage can be exposed to groundborne vibration levels of 0.12 inches per second without experiencing structural damage.[2]

State

There are no adopted State policies or standards for ground-borne vibration. However, Caltrans recommends that extreme care be taken when sustained pile driving occurs within 7.5 meters (25 feet) of any building, and 15 to 30 meters (50 to 100 feet) of a historic building or a building in poor condition.

Local

Some local jurisdictions regulate vibration through enforcement of local ordinance standards. These standards generally relate to preventing perceptible vibration from being generated past the property line of the source location.

EXISTING SETTING

Noise

Many principal noise generators within the SCAG region are associated with transportation (i.e., airports, freeways, arterial roadways, seaports, and railroads). Additional noise generators include stationary sources, such as industrial manufacturing plants and construction sites. Local collector streets are not considered to be a significant source of noise since traffic volume and speed are generally much lower than for freeways and arterial roadways. Generally, transportation-related noise sources characterize the ambient noise environment of an area.

Airports. The SCAG region contains six established air carrier airports including Los Angeles International (LAX), Bob Hope (formerly Burbank), John Wayne, Long Beach, Ontario and Palm Springs. There are also four new and emerging air carrier airports in the Inland Empire and North Los Angeles County. These include San Bernardino International Airport (formerly Norton Air Force Base), March Inland Port (joint use with March Air Reserve Base), Southern California Logistics Airport (formerly George Air Force Base) and Palmdale Airport (joint use with Air Force Plant 42).

Freeways and Arterial Roadways. The region has more than 20,000 centerline (route) miles and more than 67,000 lane-miles of roadways, including one of the most extensive High-Occupancy Vehicle (HOV) lane systems in the country. Additionally, the region has a growing network of tolled lanes and High Occupancy Toll (HOT) lanes. Regionally significant arterials provide access to the freeway system and often serve as parallel alternate routes; in some cases, they are the only major system of transportation available to travelers.

[2]Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

The extent to which traffic noise levels along these roads affect sensitive land uses depends upon a number of factors. These include whether the roadway itself is elevated above grade or depressed below grade, whether there are intervening structures or terrain between the roadway and the sensitive uses, and the distance between the roadway and such uses. For example, measurements show that depressing a freeway by approximately 12 feet yields a reduction in traffic noise relative to an at-grade freeway of 7 to 10 dB at all distances from the freeway.[3]

Traffic noise from an elevated freeway is typically 2 to 10 dB less than the noise from an equivalent at-grade facility within 300 feet of the freeway, but beyond 300 feet, the noise radiated by an elevated and at-grade freeway (assuming equal traffic volumes, fleet mix, and vehicle speed) is the same.[4]

Additionally, the region has an enormous number of arterial roadways. Typical arterial roadways have one or two lanes of traffic in each direction, with some containing as many as four lanes in each direction. Noise from these sources can be a significant environmental concern where buffers (e.g., buildings, landscaping, etc.) are inadequate or where the distance from centerline to sensitive uses is relatively small. Given typical daily traffic volumes of 10,000 to 40,000 vehicle trips, noise levels along arterial roadways typically range from DNL 65 to 70 dB at a distance of 50 feet from the roadway centerlines.

Railroad Operations. Railroad operations generate high, relatively brief, intermittent noise events. These noise events are an environmental concern for sensitive uses located along rail lines and in the vicinities of switching yards. Locomotive engines and the interaction of steel wheels and rails primarily generate rail noise. The latter source creates three types of noise: 1) rolling noise due to continuous rolling contact, 2) impact noise when a wheel encounters a rail joint, turnout or crossover, and 3) squeal generated by friction on tight curves. For very high speed rail vehicles, air turbulence can be a significant source of noise. In addition, use of air horns and crossing bell gates contribute to noise levels in the vicinity of grade crossings. **Table 3.9-3** provides reference noise levels in terms of Sound Exposure Levels for different types of rail operations.

TABLE 3.9-3: REFERENCE NOISE LEVELS FOR VARIOUS RAIL OPERATIONS

Source/Type		Reference Condition	Reference Noise Level (SEL, dBA)
Commuter Rail, At-Grade	Locomotives	Diesel-electric, 3,000 horsepower, throttle 5	92
		Electric	90
	Diesel Multiple Unit	Diesel-powered, 1,200 horsepower	85
	Horns	Within one-quarter mile of grade crossing	110
	Cars	Ballast, welded rail	82
Rail Transit		At-grade, ballast, welded rail	82
Transit Whistles/Warning Devices		Within one-eight mile of grade crossing	93
Automated Guideway Transit	Steel Wheel	Aerial, concrete, welded rail	80
	Rubber Tire	Aerial, concrete, guideway	78
Monorail		Aerial, straddle beam	82
Maglev		Aerial, open guideway	72

SOURCE: FTA, *Transit Noise and Vibration Impact Assessment*, May 2006.

Freight Trains. Noise levels generated by freight train passby events reflect locomotive engine noise and rail car wheel rail interaction. The former depends upon track grade conditions (i.e., uphill versus downhill) and is largely independent of speed whereas the latter is highly speed dependent, increasing approximately 6 dB for each doubling of train velocity.[5] In addition to noise, freight trains also generate substantial amounts

[3]Beranek, L. L. 1988. *Noise and vibration control* (pp. 182). New York: McGraw-Hill.
[4]*Ibid*.
[5]"Class I" railroads have annual gross revenues of $250 million or more.

of ground-borne noise and vibration in the vicinity of the tracks. Ground-borne noise and vibration is a function of both the quality of the track and the operating speed of the vehicles.

The SCAG region has an extensive network of railroad lines belonging primarily to two major railroads: Union Pacific Railroad (UP) and Burlington Northern/Santa Fe Railway (BNSF).[6] SCAG's Inland Empire Railroad Main Line Study suggest that the number of freight trains on most BNSF and UP lines will more than double between 2000 and 2025 in response to a tripling of container volume at the San Pedro Bay Ports. A rail line supporting 40 freight trains per day generates approximately DNL 75 dB at 200 feet from the tracks. BNSF rail lines extend south from switching yards in eastern Los Angeles to the Los Angeles and Long Beach ports complex and east to Arizona and points beyond via San Bernardino County. BNSF generates approximately DNL 75 dB at a distance of 200 feet from the tracks.

Commuter and Inter-city Passenger Trains. In general, the noise generated by commuter rail facilities (powered by either diesel or electric locomotives) is from the locomotives themselves. In the SCAG region, there are two commuter and inter-city passenger train operators: Amtrak and the Southern California Regional Rail Authority (SCRRA). Amtrak operates trains with destinations in Seattle, Chicago, Orlando, San Diego, and San Luis Obispo. A typical Amtrak passby event generates SEL 107 dB at 50 feet[7]; two such events during the daytime or evening periods generate approximately DNL 61 dB at 50 feet and approximately DNL 52 dB at 200 feet. Nine such events generate approximately DNL 67 dB at 50 feet and 58 DNL dB at 200 feet.

The SCRRA operates the Metrolink commuter rail system. This system currently includes seven rail lines, and 55 stations with destinations in Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego Counties. Noise levels generated by Metrolink are similar to those associated with Amtrak.

Port Operations. The Ports of Long Beach, Los Angeles and Hueneme are major regional economic development centers. The San Pedro Bay Ports, which include the Los Angeles and Long Beach Ports, currently handle approximately 40 percent of the volume imported into the country and approximately 24 percent of the nation's exports, the Port of Hueneme in Ventura County is a major shipping point for automobiles, fresh fruit and produce. Approximately $7 billion in cargo travels through the Port of Hueneme annually, and trade-related activity generated by the Port contributes significantly to the local economy.

At the ports, noise is generated from four sources: ships using the port facilities; equipment associated with cargo activity within the port; and truck and rail traffic that move cargo to and from the ports. All sources affect the ambient noise levels in the port areas. Residential areas in San Pedro and West Long Beach are affected most by truck and rail traffic related to the ports.

The Alameda Corridor provides a substantial long-term reduction in noise and vibration associated with rail operations in the vicinities of the Ports of Long Beach and Los Angeles. The Alameda Corridor consolidates the operations of UP and BNSF on 90 miles of existing branch line tracks into one 20-mile corridor along Alameda Street. This corridor provides a direct connection between the ports of Long Beach and Los Angeles and the UP and BSNF switching yards in eastern Los Angeles. The project includes four overpasses and three underpasses at intersections south of SR-91 that allow vehicles to pass above the trains. North of SR-91, trains pass through a 10-mile, 33-foot-deep trench. The construction of tracks in a below-grade trench, track construction on new base materials, and the use of continuous welded track reduce noise impacts on adjacent uses from trains associated with the ports. The project also includes sound walls in

[6]Two of the major railroads that historically have been associated with California, the Southern Pacific Railroad and the Atchison, Topeka and Santa Fe Railway, have merged into other railroad companies. In 1995, the Atchison Topeka and Santa Fe Railway merged with Burlington Northern to become Burlington Northern Santa Fe Railway. In the following year, the Southern Pacific Railroad merged with Union Pacific Railroad with the merged company retaining the Union Pacific name.

[7]County of Ventura. May 1988. Ventura County General Plan, Hazards Appendix. Ventura, CA: Author.

certain locations to mitigate vehicle noise along Alameda Street in residential neighborhoods and other sensitive areas.

Industrial, Manufacturing, and Construction. Noise from industrial complexes, manufacturing plants and construction sites are characterized as stationary, or point, sources of noise even though they may include mobile sources, such as forklifts and graders. 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.

Industrial complexes and manufacturing plants are generally located away from sensitive land uses, and, as such, noise generated from these sources generally has less effect on the local community. In contrast to industrial and manufacturing plants, construction sites are located throughout the region and are often located within, or adjacent to, residential districts. In general, construction activities generate high noise levels intermittently on and adjacent to the construction sites, and the related noise impacts are short-term in nature. The dominant source of noise from most construction equipment is the engine, usually a diesel engine, with inadequate muffling. In a few cases, however, such as impact pile driving or pavement breaking, noise generated by the process dominates. Construction equipment can be considered to operate in two modes, stationary and mobile. Stationary equipment operates in one location for one or more days at a time, with either a fixed-power operation (pumps, generators, compressors) or a variable noise operation (pile drivers, pavement breakers). Mobile equipment moves around the construction site with power applied in cyclic fashion (bulldozers, loaders), or movement to and from the site (trucks).[8]

Construction-related noise levels generally fluctuate depending on the construction phase, equipment type and duration of use, distance between noise source and receptor, and presence or absence of barriers between noise source and receptor. **Table 3.9-4** shows typical noise levels associated with various types of construction-related machinery. These noise levels, which correspond to a distance of 50 feet, decrease by approximately 6 dB with each doubling of distance from the construction site (e.g., noise levels from excavation might be approximately 83 dB at 100 feet from the site, and about 77 dB at 200 feet from the site). Interior noise levels from construction are approximately 10 dB (open windows) to 20 dB (closed windows) less than exterior noise levels due to the attenuation provided by building facades.[9]

Steel Wheel Urban Rail Transit. This category includes both heavy and light rail transit. Heavy rail is generally defined as electrified rapid transit trains with dedicated guideway, and light rail as electrified transit trains that do not require dedicated guideway. In general, noise increases with speed and train length. Sensitivity to rail noise generally arises when there is less than 50 feet between the rail and sensitive receptors. A significant percentage of complaints about noise can be attributed to the proximity of switches, rough or corrugated track, or wheel flats. In the SCAG region, the Los Angeles County Metropolitan Transit Authority (Metro) provides urban rail transit service on four lines within Los Angeles County. The Blue Line extends from Long Beach to the 7th Street Metro Center in downtown Los Angeles. The Red Line connects Union Station with North Hollywood via the Metro Center, the Gold Line connects Union Station with Pasadena, and the Green Line extends from Redondo Beach to Norwalk. Individual urban rail transit passby events generate substantially less noise than commuter rail events, but the aggregate noise impact for sensitive uses along the line can be similar or greater due to the much higher number of events.

[8]County of Ventura. May 1988. Ventura County General Plan, Hazards Appendix. Ventura, CA: Author.

[9]Cornett, C.L. and Hina, C.E. 1979. Methods for predicting noise and vibration impacts. Washington, DC: United States Department of Transportation, Transportation Systems Center.

TABLE 3.9-4: DEMOLITION AND CONSTRUCTION EQUIPMENT SOURCE NOISE LEVELS	
Equipment	**Levels in dBA at 50 feet**
Front Loader	73-86
Trucks	82-95
Cranes (Moveable)	75-88
Cranes (Derrick)	86-89
Vibrator	68-82
Saws	77-82
Pneumatic Impact Equipment	83-88
Jackhammers	81-98
Pumps	68-72
Generators	71-83
Compressors	75-87
Concrete Mixers	75-88
Concrete Pumps	81-85
Back Hoe	73-85
Pile Driving (Peaks)	95-107
Tractor	77-98
Scraper/Grader	80-93
Paver	85-88
SOURCE: USEPA, *Noise From Construction Equipment and Operations, Building Equipment and Home Appliances, PB 206717*, 1971.	

Vibration

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 can generate groundborne vibrations that vary depending on vehicle type, weight, and pavement conditions. Heavy trucks typically operate on major streets. Nonetheless, vibration levels adjacent to roadways are typically not perceptible.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others due to noise exposure (in terms of both exposure time and "insulation" from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, natural areas, parks and outdoor recreation areas are generally more sensitive to noise than are commercial and industrial land uses. Consequently, the noise standards for sensitive land uses are more stringent than those for less sensitive uses, such as commercial and industrial.

To protect various human activities and sensitive land uses (e.g., residences, schools, and hospitals) lower noise levels are needed. A noise level of DNL 55 to 60 dB outdoors is the upper limit for intelligible speech communication inside a typical home. In addition, social surveys and case studies have shown that complaints and community annoyance in residential areas begin to occur at DNL 55 dB. Sporadic complaints associated with the DNL 55 to 60 dB range give way to widespread complaints and individual threats of legal action within the DNL 60 to 70 dB range. At DNL 70 dB and above, residential community reaction typically involves threats of legal action and strong appeals to local officials to stop the noise.

The SCAG region encompasses a large area with a wide variety of noise sources and noise levels. The ambient noise environment ranges from low levels associated with wilderness areas to high levels associated with airports and heavily trafficked roadways. Given the size of the SCAG region and the variation in sources it is not useful to complete a detailed noise monitoring study for this EIR. Rather this PEIR presents a discussion of noise levels associated with different noise sources and thereby allows the reader to infer the noise level at different locations depending on the proximity of a location to a noise source.

Tables 3.9-5 and **3.9-6** provide the reader with examples of existing noise levels by location and type of land use. The City of Los Angeles presumed ambient noise levels presented in **Table 3.9-5** are helpful for understanding ambient noise levels. These noise levels are sometimes lower than actual noise levels in residential and commercial areas since mobile source noise can add substantially to theses presumed levels.

TABLE 3.9-5: CITY OF LOS ANGELES PRESUMED AMBIENT NOISE LEVELS

Zone	Presumed Ambient Noise Level (dBA)	
	Day	Night
Residential	50	40
Commercial	60	55
Light Industrial	65	65
Heavy Industrial	70	70

SOURCE: City of Los Angeles, Chapter XI of the Noise Regulation, Section 111.03.

TABLE 3.9-6: NOISE MONITORING DATA

Location	Source	Peak Hour Noise Level (dBA, L_{eq})
City of Los Angeles	Recreation (Elysian Reservoir)	42
City of Los Angeles	Residential Area	51
City of Los Angeles	Industrial Area (Port)	67
City of Redlands	Freeway	65
City of Santa Monica	Residential Area	50
City of West Covina	Commercial Area	60

SOURCE: TAHA, 2011.

In addition, recent noise monitoring data collected at different points in the region have been aggregated in **Table 3.9-6** to show example noise levels. These data indicate that noise levels vary greatly depending on the location and the source.

THRESHOLDS OF SIGNIFICANCE

The 2012-2035 RTP/SCS would have a significant impact related to noise if it would:

- Expose persons or generate noise in levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose people to or generate excessive groundborne vibration or groundborne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; and/or
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the 2012-2035 RTP/SCS on noise.[10]

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of noise includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan were adopted. This evaluation is not included in the determination of the significance of impacts (which is based on a comparison of future conditions with the Plan to today); however, it provides a meaningful perspective on the effects of the 2012-2035 RTP/SCS.

Determination of Significance

Noise associated with highway traffic is dependent on a number of variables including:

- Traffic volume
- Motor vehicle speed
- Motor vehicle fleet mix (cars, trucks, etc.)
- Location of the roadway with respect to sensitive receptors

In order to assess potential noise impacts, roadways in the region were assessed to determine where:

1. Traffic volume is anticipated to increase 100 percent from existing conditions,
2. Truck (medium and heavy-duty) volume is anticipated to increase 130 percent from existing conditions; and
3. Truck (medium and heavy-duty) volume is anticipated to increase by 100 percent with an increase in other vehicles of 50 percent.

All roadways identified to meet any of these criteria would be anticipated to have a potential significant impact on noise if sensitive receptors are located adjacent to the facilities.

Roadways with speeds less than 17 miles per hour were excluded as well as those with a volume to capacity ratio of greater than 1.0 (vehicle speeds less than 30 miles per hour) were excluded as such roadways would be anticipated to have a noise level of less than 66 dBA – the FHWA threshold for significant impact to adjacent sensitive receptors.

[10]The Environmental Justice section of the Plan and associated appendix contains substantial analysis of potential noise impacts to low income, minority and other protected groups. See Environmental Justice Appendix of the 2012-2035 RTP/SCS. However, the PEIR does not rely on this analysis as it addresses noise impacts to the community as a whole.

Since this document analyzes noise impacts on a program level only, project-level analysis of impacts will also be necessary. Moreover, all mitigation measures should be included in project-level analysis as appropriate. The project proponent or local jurisdiction shall be responsible for ensuring adherence to the mitigation measures prior to construction. For regionally significant projects, SCAG shall be provided with documentation of compliance with mitigation measures through its Intergovernmental Review Process in which all regionally significant projects, plans, and programs must be consistent with regional plans and policies.

IMPACTS

Impact 3.9-1: Grading and construction activities associated with the proposed freeway, arterial, transit, and rail projects, identified in the 2012-2035 RTP/SCS, as well as development anticipated by the Plan would intermittently and temporarily generate noise and vibration levels above ambient background levels. Noise and vibration levels in the immediate vicinity of the construction sites would increase substantially sometimes for extended duration. Therefore, without mitigation, the Plan would result in a significant impact related to construction noise and vibration.

Noise

Freeway and arterial projects proposed in the Plan include the widening of existing freeways and the construction of new interchanges. A few projects would involve constructing new freeway segments, including auxiliary capacity enhancement facilities and mixed flow connectors. The Plan also includes transit, passenger and high-speed rail (including the California High Speed Train (HST), and grade separation projects.

Development to accommodate the forecast population and employment would take a variety of forms, with a substantial fraction focused around High Quality Transit Areas (HQTAs). Because development would be focused in HQTAs, residents in those areas would be subject to high levels of construction as well as operational noise and vibration as compared to existing conditions.

Table 3.9-7 shows existing sensitive receptors within 0.25 miles of No Project and Plan transportation projects.

TABLE 3.9-7: SENSITIVE RECEPTORS WITHIN 0.25 MILES OF PLAN PROJECTS

	No Project	2012-2035 RTP/SCS
Colleges	15	58
Hospitals	6	45
K-12 Schools	147	541
Nursing Homes	37	186
Senior Centers	6	47
Urgent Care Centers	4	36

SOURCE: Environmental Justice Appendix, Exhibit 35, p. 138; SCAG, 2011.

Construction activities associated with the Plan would result in temporary noise increases at nearby sensitive receptors. **Table 3.9-8** presents the different types of freeway, transit and goods movement projects which typically emit noise during construction. The table also shows the relative duration of construction noise created by project type. The table does not include development types since the variety and duration of such projects is infinite resulting in a wide variety of noise levels and durations. Impacts to sensitive receptors resulting from transportation and development projects would depend on several factors, such as the type of project proposed, adjacent land use, and duration of proposed construction activities. Construction noise

levels would fluctuate depending on construction phase, equipment type, and duration of use; distance between noise source and receptor; and presence or absence of barriers between noise source and receptor.

TABLE 3.9-8: TYPES AND DURATION OF NOISE PRODUCED BY PROPOSED PROJECTS

	Noise Levels			Duration		
Project Type	**High**	**Medium**	**Low**	**Extended**	**Medium**	**Short**
FREEWAYS AND ARTERIALS						
Arterials/Interchanges	X			X		
Expressway	X			X		
Freeway – Mixed-flow	X			X		
HOV Connector	X			X		
Reconfigure Ramp	X			X		
Replace Overcrossing	X			X		
Capacity Enhancement Facilities	X			X		
Widen Underpass (4-6 lanes)	X			X		
Auxiliary Lanes		X			X	
Climbing Lanes		X			X	
HOT Lanes		X			X	
Interchange Addition		X			X	
Bikeways		X				X
Capacity Enhanced Arterial		X				X
Interchange Improvement		X			X	
Park & Ride		X				X
Roadway Operations & Maintenance			X			X
Smart Street Improvements			X			X
TRANSIT						
Commuter Rail	X			X		
High Speed Rail	X			X		
Inter-city Rail	X			X		
Transit Center		X			X	
Grade Crossing			X			X
Intelligent Transportation Systems			X			X
Light Rail	X			X		
Rail Improvement	X			X		
Rail Tunnel Improvement	X			X		
GOODS MOVEMENT						
Port Rail Access Improvements	X			X		

Note: Project-specific impacts depend on location and location of sensitive receptors. This table provides a general assessment of noise-generated by different types of impacts irrespective of the relationship to sensitive receptors.
SOURCE: TAHA, 2011.

Sensitive receptors could be affected by projects involving the construction of new systems (new facilities, capacity enhancement facilities, rail corridors, interchanges, underground rail lines, etc.), and development projects located within the vicinity of the receptor. Generally, construction related noise impacts would be short-term and localized in nature. Implementation of Mitigation Measures **MM-NO1** through **MM-NO5** would reduce construction noise impacts; however, impacts would remain significant.

Vibration

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 in close proximity to the source. As shown in **Table 3.9-9**, the highest impact or heaviest equipment, such as pile drivers or large bulldozers, can generate vibrations of 1.518 to 0.089 inches per second PPV at a distance of 25 feet.

TABLE 3.9-9: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Equipment		PPV at 25 feet (Inches per Second)	Approximate Vdb at 25 feet
Pile Driver (Impact)	Upper Range	1.518	112
	Typical	0.644	104
Pile Driver (Sonic)	Upper Range	0.734	105
	Typical	0.170	93
Vibratory Roller		0.210	95
Clam Shovel Drop (Slurry Wall)		0.202	94
Hydrol Mill (Slurry Wall)	In Soil	0.008	66
	In Rock	0.017	75
Large Bulldozer		0.089	87
Caisson Drilling		0.089	87
Loaded Trucks		0.076	86
Jackhammer		0.035	79
Small Bulldozer		0.003	58

SOURCE: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, 2006.

Typical project construction activities, such as the use of jackhammers, other high-power or vibratory tools, compactors, and tracked equipment, may also potentially generate substantial vibration (i.e., greater than 0.2 inches per second PPV) in the immediate vicinity, typically within 15 feet of the equipment. However, building construction does not typically have these larger sources of vibration and is, therefore, not anticipated to be a source of substantial vibration. By use of administrative controls, such as scheduling, 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 when it occurs within 50 feet of structures. Vibration levels generated by pile driving activities would vary depending on project conditions, such as soil conditions, construction methods, and equipment used. Pile driving activities may result in short-term annoyance. Depending on the proximity of existing structures to each construction site, the structural soundness of the affected buildings, and the methods of construction used, vibration levels 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 within 100 feet and may be high enough to damage existing structures within 50 feet.

Light industrial and commercial operations have, on occasion, been known to utilize equipment or processes in the manufacture and distribution of materials that have a potential to generate vibration. However, vibrations found to be excessive for human exposure that are the result of a manufacturing process or industrial machinery are generally addressed from an occupational health and safety perspective. The

residual vibrations from industrial processes or machinery are typically of such low amplitude that they quickly dissipate into the surrounding soil and are rarely perceivable at the surrounding land uses.

Distribution of materials to and from industrial and commercial land uses can have the potential to generate more substantial levels of vibration than that of the mechanical equipment. Heavy trucks used for delivery and distribution of materials to and from industrial and commercial sites generally operate at very low speeds while on the industrial or commercial site. Therefore, the vibration induced by heavy truck traffic at industrial or commercial land uses is not anticipated to be perceptible at distances greater than 25 feet (typical distance from roadway centerline to edge of roadway right-of-way for a single-lane road). Implementation of Mitigation Measures **MM-NO6** and **MM-NO7** would reduce construction vibration impacts; however, impacts would remain significant.

Impact 3.9-2: Noise-sensitive land uses could be exposed to operational noise in excess of normally acceptable noise levels and/or could experience substantial increases in noise as a result of; a) the operation of expanded or new transportation facilities (i.e., new or increased traffic resulting from new highways, addition of highway lanes, roadways, ramps, goods movement facilities, grade separations and new transit facilities, etc.); and/or b) increased vehicle activity (autos, trucks, buses, planes, trains, etc.) from increased activity associated with development resulting in increased ambient noise next to transportation facilities. Without mitigation, the Plan would result in a significant impact related to land use compatibility.

At the regional scale, the noise impacts of new highways, highway widening, new HOV lanes, new transit corridors, and increased frequency along existing transit corridors are generally expected to exceed the significance criteria when they occur near sensitive receptors. Many noise-sensitive land uses are located near Plan projects, including hospitals schools, nursing homes and senior centers. In addition, as discussed in Chapter 2.0 Project Description, the Plan would result in concentration of development in HQTAs. These HQTAs are located adjacent to transit and frequently located near other transportation facilities. Therefore under the Plan more sensitive receptors would be located adjacent to transportation facilities and would therefore be exposed to transportation-related noise. It is estimated that in 2035, 3,235 acres of low, medium, and rural density residential land uses would be within 150 feet of, and could be affected by, major transportation projects in the 2012-2035 RTP/SCS. Many more acres would be within 0.25 miles of affected transportation facilities.

Noise impacts would be expected adjacent to transportation facilities including highways, freeways, rail transit, toll-ways, truck-climbing lanes, freeway interchanges, and passenger and high-speed rail projects. It is anticipated that each of the projects included in the Plan would be subject to project-specific environmental review as part of the design and approval process for each facility.

Similarly individual development projects would be subject to project specific environmental review as appropriate. Some development projects would be so small as to not require environmental review, some projects may receive streamlined environmental review as a result of SB 375 or other legislation. For these projects that would not receive project-specific review it is anticipated that they would comply with local ordinances designed to reduce impacts and/or they would comply with mitigation measures included in this EIR or other environmental documents as may be appropriate (such as General Plan or Specific plan environmental documents). Many development projects especially larger projects would receive project-specific environmental review.

Freeways and Freight Corridors

As noted above, in order to assess potential noise impacts, roadways in the region were assessed to determine where:

1. Traffic volume is anticipated to increase 100 percent from existing conditions;

2. Truck (medium and heavy-duty) volume is anticipated to increase 130 percent from existing conditions; and
3. Truck (medium and heavy-duty) volume is anticipated to increase by 100 percent with an increase in other vehicles of 50 percent.

Modeling of regional traffic has shown that 92 to 100 percent of regional freeways miles and 10 to 24 percent of arterial/collector streets in the SCAG region currently exceed this criterion at adjacent land uses. The percentage of freeways exceeding this criterion would remain approximately the same in 2035 and the percentage of arterials/collectors would increase from 18 to 35 percent.[11] The criterion is only applicable if sensitive receptors are located adjacent to the freeways and collectors/arterials.

Changes in the percentage of miles of noise affected freeways and arterials are a direct result of increases and decreases in the traffic volumes, changes in fleet mix, and speeds assigned to each roadway in each county and additional interstate facilities proposed with the alternatives. In addition to changes to existing roadways (see Appendix B for the full list of RTP projects), the following new facilities would be constructed:

- High Desert Corridor (Los Angeles and San Bernardino Counties); approximately 75 miles
- I-710 North Gap Closure (Los Angeles County); approximately 4 miles
- East-West Freight Corridor (Los Angeles and San Bernardino Counties); approximately 42 miles from I-710 to I-15
- SR-241 (Orange County); approximately 15 miles

Figure 3.9-2 shows roadways in the SCAG region adjacent to which noise impacts could occur as a result of increased auto and/or truck traffic. Implementation of Mitigation Measures **MM-NO8** through **MM-NO14** would reduce freeway and freight corridor noise impacts; however, impacts would remain significant.

Transit

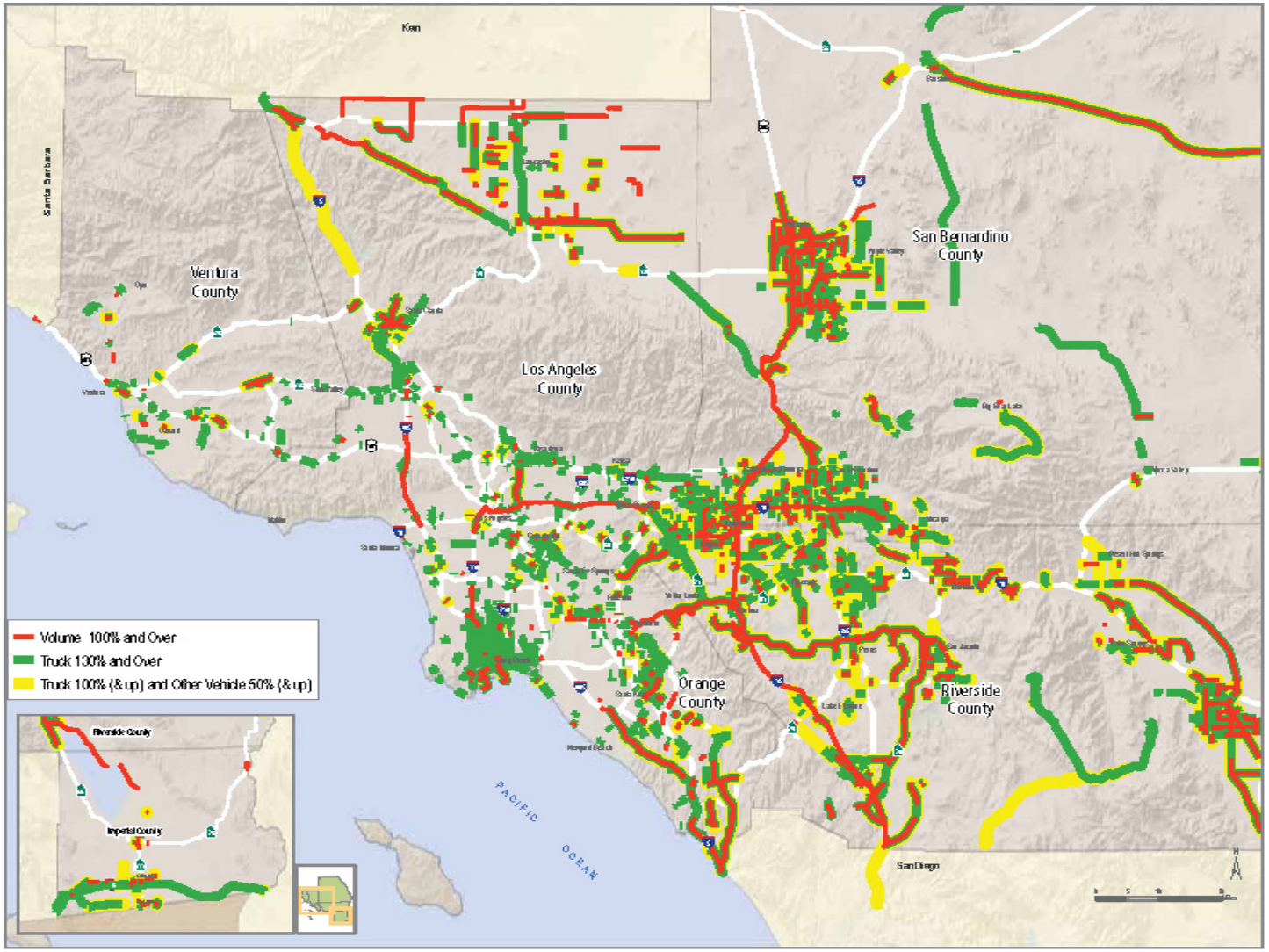
The Plan includes significant investments in urban rail, commuter rail, intercity passenger rail, and the eventual implementation of the HST. This plan lays out an investment strategy of incremental speed and capacity improvements to existing Amtrak and Metrolink service to provide interim high speed service within the SCAG region, while building towards an eventual connection to the statewide high speed network. A series of grade separations, grade closures, track expansions, station improvements, earthen works, and other improvements will allow more and faster service in the Los Angeles to San Diego (LOSSAN) Rail Corridor and Antelope Valley Corridors.

A phased HST implementation strategy, in accordance with the 2012 California High Speed Rail Authority Business Plan, will provide initial high-speed train service to the San Fernando Valley, being extended south to Los Angeles Union Station and the Anaheim Regional Transportation Intermodal Center by 2035. As these efforts are still in the initial stages of planning and analysis, alignment and schedule details are subject to change.

Improvements, additions and extension of transit corridors, specifically associated with bus rapid transit, light rail, passenger rail and high-speed rail activity, would expose existing and future noise-sensitive land uses to high levels of noise generated by high-volume transit corridors. Noise levels would increase along bus and rail corridors where speeds are increased, trains are double-tracked and/or the number of trains increases as a result of physical and/or programmatic changes. The Plan also emphasizes development in High Quality Transit Areas (HQTA) that would increase the number of people exposed to noise from transit.

[11] SCAG, *2008 Regional Transportation Plan Final EIR*, April 2008.

Figure 3.9-2: SCAG Region Roadway Noise (2035 Plan from Existing Conditions)



SOURCE: SCAG Transportation Modeling, 2011

Noise would also increase adjacent to new bus and rail corridors where there were previously no buses or trains. Increased noise levels would only be relevant where adjacent sensitive receivers are located along existing or proposed corridors. Crossings also use audible warning signals that could impact nearby residents. Increases in bus and rail traffic could also lead to more horns and/or whistles at crossings near residential areas, which is a source of annoyance, especially at night or in early morning or evening. Implementation of Mitigation Measures **MM-NO15** through **MM-NO17** would reduce transit noise impacts; however, impacts would remain significant.

Goods Movement

The Plan includes facilities and actions that encourage more efficient intermodal transportation of goods including roadways and train facilities. The number of freight trains currently operating each day in the SCAG region is dependent upon the demands of the industries using rail services and can vary greatly from day to day. The Plan includes proposed rail capacity improvements to reduce current passenger/freight rail bottlenecks and increase capacity for existing freight. While increases in rail freight transport would increase the number of freight trains, these trains would likely operate on an as-needed basis and would not have a fixed schedule. Therefore, noise levels and frequency of passbys would continue to vary greatly from day to day. On some days there may be no increase in freight train activity. Overall, however, an increase in train traffic would yield a consequent increase in noise in areas adjacent to rail corridors. Implementation of Mitigation Measures **MM-NO15** and **MM-NO16** would reduce goods movement noise impacts; however, impacts would remain significant. Emphasis on development in HQTAs may have some related increase in exposure of noise to people from freight rail, particularly where regional transit operates on the same corridor (e.g., LOSSAN and portions of Metrolink).

Impact 3.9-3: Vibration-sensitive land uses could be exposed to vibration in excess of normally acceptable levels and/or could experience substantial increases in vibration as a result of the operation of expanded or new transportation facilities. Without mitigation, the Plan would result in a significant impact related to vibration.

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 generates vibration amplitudes high enough to cause structural or cosmetic damage, except in rare cases (for example where heavy truck traffic passes in close proximity to fragile older buildings). Heavy trucks traveling over potholes or other discontinuities in the pavement can cause vibration high enough to result in complaints from nearby residents, which typically can be addressed by smoothing the roadway surface.[12] Caltrans conducted several transportation-related vibration analyses that determined traffic rarely generates vibration amplitudes high enough to cause structural or cosmetic damage. Based on vibration measurements throughout California, worst-case traffic vibrations were shown to drop below the threshold of perception at distances of 150 feet or greater. Given that sensitive receptors are located within 150 feet of facilities that would be impacted by increased truck traffic it is anticipated that the Plan would result in a significant impact related to vibration associated with truck traffic. It is estimated that in 2035, 3,235 acres of low, medium, and rural density residential land uses would be within 150 feet of, and could be affected by, major transportation projects in the 2012-2035 RTP/SCS.

While Caltrans in not usually involved in rail projects, on occasion the effects of train activity on a Caltrans facility has been of concern. Thus, Caltrans conducted several measurements of train activity throughout the State and measured a peak vibration level of 0.36 inches per second PPV at ten feet from the track. Based on this reference vibration level, vibrations from train activity would drop below the threshold of perception at distances greater than 250 feet.

[12]Caltrans, *Transportation- and Construction-Induced Vibration Guidance Manual*, 2004.

The Plan includes the development of additional railway facilities along existing tracks. Thus, the number of daily events would increase, and the highest peak vibration level would be increased relative to the existing condition. In general, additional trains passing at the same point would show up as higher peaks that may expose local sensitive receptors to vibration to a substantial increase in vibration levels relative to the existing condition. Implementation of Mitigation Measure **MM-NO18** would reduce vibration impacts; however, impacts would remain significant.

Cumulative Impact 3.9-4: The Plan would contribute to cumulative ambient noise and vibration levels in areas outside the region as a result of the operation of expanded or new transportation facilities (i.e., increased traffic resulting from new highways, addition of highway lanes, roadways, ramps, and new use of new transit and rail facilities as well as increased use of existing transit and rail facilities, etc.). Therefore, the Plan would contribute to a cumulatively considerable noise impact in these areas.

The 2012-2035 RTP/SCS could have a significant impact on noise and vibration outside the region. Cumulative transportation noise would increase outside the region partially as a result of increased activity resulting from the Plan. This ambient noise increase could be related to aircraft overflights, port noise, ship horns, railroads, as well as freeway, arterial and transit noise. Implementation of Mitigation Measures **MM-NO1** and **MM-NO18** would reduce vibration impacts; however, impacts would remain significant.

MITIGATION MEASURES

Mitigation Measures **MM-NO1** through **MM-NO18** can and should be implemented by project sponsors (for both development and transportation projects) as applicable. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions.

MM-NO1: To reduce noise impacts due to construction, project sponsors can and should require construction contractors to implement a site-specific noise reduction program, subject to the Lead Agency (or other appropriate government agency) review and approval, which includes the following measures:

- Equipment and trucks used for project construction can and should utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible).
- Except as may be exempted by the Lead Agency (or other appropriate government agency), impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction can and should be hydraulically or electrically powered to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust should be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves should be used, if such jackets are commercially available and this could achieve a reduction of 5 dBA. Quieter procedures should be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures.
- Stationary noise sources can and should be located as far from adjacent sensitive receptors as possible and they should be muffled and enclosed within temporary sheds, incorporate insulation barriers, or use other measures as determined by the Lead Agency (or other appropriate government agency) to provide equivalent noise reduction.

MM-NO2: Prior to the issuance of a building permit, along with the submission of construction documents, each project sponsor can and should submit to the Lead Agency (or other government agency as appropriate) a list of measures to respond to and track complaints pertaining to construction noise. These measures should include:

- A procedure and phone numbers for notifying the Lead Agency staff and local Police Department; (during regular construction hours and off-hours);
- A sign posted on-site pertaining with permitted construction days and hours and complaint procedures and who to notify in the event of a problem. The sign should also include a listing of both the Lead Agency and construction contractor's telephone numbers (during regular construction hours and off-hours);
- The designation of an on-site construction complaint and enforcement manager for the project;
- Notification of neighbors and occupants within 300 feet of the project construction area at least 30 days in advance of extreme noise generating activities about the estimated duration of the activity; and
- A preconstruction meeting can and should be held with the job inspectors and the general contractor/on-site project manager to confirm that noise measures and practices (including construction hours, neighborhood notification, posted signs, etc.) are completed.

MM-NO3: Project sponsor can and should implement use of portable barriers in the vicinity of sensitive receptors during construction including construction of subsurface barriers, debris basins, and storm water drainage facilities.

MM-NO4: For projects that require pile driving or other construction noise above 90 dBA in proximity to sensitive receptors, to further reduce potential pier drilling, pile driving and/or other extreme noise generating construction impacts greater than 90dBA, a set of site-specific noise attenuation measures can and should be completed under the supervision of a qualified acoustical consultant. Prior to commencing construction, a plan for such measures should be submitted for review and approval by the Lead Agency (or other appropriate government agency) to ensure that maximum feasible noise attenuation will be achieved. This plan should be based on the final design of the project. A third-party peer review, paid for by the project sponsor, may be required to assist the Lead Agency in evaluating the feasibility and effectiveness of the noise reduction plan submitted by the project sponsor. The criterion for approving the plan should be a determination that maximum feasible noise attenuation will be achieved. The noise reduction plan can and should include, but not be limited to, an evaluation of implementing the following measures. These attenuation measures can and should include as many of the following control strategies as applicable to the site and construction activity:

- Erect temporary plywood noise barriers around the construction site, particularly along on sites adjacent to residential buildings;
- Implement "quiet" pile driving technology (such as pre-drilling of piles, the use of more than one pile driver to shorten the total pile driving duration), where feasible, in consideration of geotechnical and structural requirements and conditions;

- Utilize noise control blankets on the building structure as the building is erected to reduce noise emission from the site;
- Evaluate the feasibility of noise control at the receivers by temporarily improving the noise reduction capability of adjacent buildings by the use of sound blankets for example and implement such measure if such measures are feasible and would noticeably reduce noise impacts**;** and
- Monitor the effectiveness of noise attenuation measures by taking noise measurements.

MM-NO5: Noise generated from any rock-crushing or screening operations performed within 3,000 feet of any occupied residence can and should be mitigated by the project sponsor by strategic placement of material stockpiles between the operation and the affected dwelling or by other means approved by the local jurisdiction.

MM-NO6: Where feasible, pile holes can and should be pre-drilled to reduce potential noise and vibration impacts.

MM-NO7: As necessary, each project sponsor can and should retain a structural engineer or other appropriate professional to determine threshold levels of vibration and cracking that could damage any adjacent historic or other structure subject to damage, and design means and construction methods to not exceed the thresholds.

MM-NO8: Project sponsors can and should comply with all local sound control and noise level rules, regulations, and ordinances.

MM-NO9: As part of the appropriate environmental review of each project, a project specific noise evaluation can and should be conducted and appropriate mitigation identified and implemented.

MM-NO10: Project sponsors can and should employ, where their jurisdictional authority permits, land use planning measures, such as zoning, restrictions on development, site design, and use of buffers to ensure that future development is compatible with adjacent transportation facilities.

MM-NO11: As a last resort, project sponsors can and should eliminate noise-sensitive receptors by acquiring freeway and rail rights-of-way. This would ensure the effective operation of all transportation modes.

MM-NO12: Project sponsors can and should, to the extent feasible and practicable, maximize the distance between noise-sensitive land uses and new roadway lanes, roadways, rail lines, transit centers, park-and-ride lots, and other new noise-generating facilities.

MM-NO13: Project sponsors can and should construct sound reducing barriers between noise sources and noise-sensitive land uses. Sound barriers can be in the form of earth-berms or soundwalls. Constructing roadways so as appropriate and feasible that they are depressed below-grade of the existing sensitive land uses also creates an effective barrier between the roadway and sensitive receptors.

MM-NO14: Project sponsors can and should, to the extent feasible and practicable, improve the acoustical insulation of dwelling units where setbacks and sound barriers do not sufficiently reduce noise.

MM-NO15: The project sponsors can and should implement, to the extent feasible and practicable, speed limits and limits on hours of operation of rail and transit systems, where such limits may reduce noise impacts.

MM-NO16: To reduce noise impacts, maximize distance of new route alignments from sensitive receptors. For example, if a transit project were constructed along the center of a freeway (as opposed to a new route or along the side of the freeway), operational noise impacts would be reduced by the increase in distance to the noise sensitive sites and the masking effects of the freeway traffic noise.

MM-NO17: Transit-related passenger stations, central maintenance facilities, decentralized maintenance facilities, and electric substations can and should be located away from sensitive receptors to the maximum extent feasible.

MM-NO18: Local jurisdictions or agencies can and should, as practical and feasible, adhere to published local, state and federal guidelines concerning groundborne vibration impacts.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Construction Noise and Vibration

Mitigation Measures **MM-NO1** through **MM-NO7** may not reduce noise levels to below significance in all cases. Therefore, the Plan would result in a significant impact related to construction noise and vibration.

Land Use Compatibility (Impact 3.9-2)

Mitigation Measures **MM-NO8** through **MM-NO17** may not reduce noise levels to below significance in all cases. Therefore, the Plan would result in a significant impact related to land use compatibility.

Vibration (Impact 3.9-3)

Mitigation Measure **MM-NO18** may not reduce noise levels to below significance in all cases. Therefore, the Plan would result in a significant impact related to vibration.

Cumulative Effects (Impact 3.9-4)

Mitigation Measures **MM-NO1** through **MM-NO18** may not reduce noise and vibration levels to below significance in all cases. Therefore, the Plan would contribute to cumulatively considerable noise and vibration impacts outside the region.

COMPARISION WITH THE NO PROJECT ALTERNATIVE

Through the construction of transportation projects, and increases in traffic volume and speed, the 2012-2035 RTP/SCS projects would create substantially more noise than the No Project Alternative. The same level of population, household and job growth is anticipated under the No Project Alternative as under the Plan, so similar amounts of development are anticipated. However, under the Plan uses are anticipated to be more compact (more multi-family as compared to single-family housing), therefore resulting in more intense areas of development and higher noise levels in the HQTAs. By not implementing the Plan the levels of cumulative ambient noise would be less than with the Plan as a result of fewer sources and reduced speeds.

Development construction noise would be less dispersed, but higher and of longer duration in HQTAs. Transportation noise would similarly be concentrated in HQTAs as compared to the No Project Alternative.

Direct Impacts

Under the No Project Alternative, no new transportation investments would be made, beyond those that are currently programmed. As a result, fewer transportation projects would be built resulting in less construction noise and fewer sensitive receptors would be exposed to construction noise. In addition, without the Plan, speeds would be reduced resulting in reduced noise levels. **The Plan impacts would be greater than the No Project Alternative impacts for Impacts 3.9-1 and 3.9-2.**

Indirect Impacts

The Plan includes transportation and land use strategies that focus growth along existing corridors and in urbanized areas (HQTAs), rather than allowing development of vacant, open space/recreation and agricultural lands. This compact development pattern included in the Plan would concentrate population in urban areas that already generally have higher ambient noise levels; the Plan would result in additional construction and operational noise in these areas. The Plan also includes increased transit (bus, rail) in urban areas that would contribute to the overall increase in noise levels. **The Plan impacts would be greater than the No Project Alternative impacts for Impacts 3.9-3.**

3.10 POPULATION, HOUSING, AND EMPLOYMENT

This section describes the current population, housing, and employment of the SCAG region identifies potential impacts of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategies (2012-2035 RTP/SCS or Plan) on these three factors, includes mitigation measures for the impacts, and evaluates the residual impacts. The data used in this section represents SCAG's most reliable available data for population, housing, and employment information.

REGULATORY FRAMEWORK

Federal

Federal planning regulations, Title 23 CFR 450.322(e), require that in development of the regional transportation plan that the MPO validate data utilized in preparing other existing modal plans for providing input to the regional transportation plan. In updating the plan, the MPO shall base the update on the latest available estimates and assumptions for population, land use, travel, employment, congestion, and economic activity. The MPO shall approve transportation plan contents and supporting analyses produced by a transportation plan update.

State

California Department of Housing and Community Development (HCD). State Housing Law (Government Code Section 65580) requires local government plans to address the existing and projected housing needs of all economic segments of the community through their housing elements. The housing element is one of seven (7) state-mandated elements that every General Plan must contain, and it is required to be updated every eight (8) years and determined legally adequate by the State. The purpose of the housing element is to identify the community's housing needs, state the community's goals and objectives with regard to housing production, rehabilitation, and conservation to meet those needs. In addition, the Housing Element defines the related policies and programs that the community will implement in order to achieve the stated goals and objectives. This would be accomplished through the allocation of regional housing needs consistent with the SCS.

California Relocation Assistance Act. The California Relocation Assistance Act (Government Code Section 7260 et seq.) establishes uniform policies to provide for the fair and equitable treatment of people displaced from their homes or businesses as a direct result of State and/or local government projects or programs. The California Relocation Assistance Act requires that comparable replacement housing be made available to displaced persons within a reasonable period of time prior to the displacement. Displaced persons or businesses are assured payment for their acquired property at fair market value. Relocation assistance in the form of advisory assistance and financial benefits would be provided at the local level. This includes aid in finding a new home location, payments to help cover moving costs, and additional payments for certain other costs.

Homeowners and Private Property Protection Act. In 2008, California voters approved Proposition 99, the Homeowners and Private Property Protection Act, which amended the California Constitution so that local governments are prohibited from using eminent domain authority to acquire an owner-occupied residence for the purposes of conveying it to a private recipient, with limited exceptions. Proposition 99 applies only to owner-occupied residences. Cities may still use eminent domain authority to convey multi-family and non-residential property to other private parties.

Regional Housing Needs Assessment (RHNA). The State law requires preparation of a Regional Housing Needs Assessment (RHNA). The RHNA is a key tool for SCAG and its member governments to plan for this growth. The RHNA quantifies the regional need for housing that is allocated to each jurisdiction for a certain planning period (e.g. in the next RHNA cycle, the period is from 2014 to 2021). Communities then plan, consider and decide how they will address this need through the process of completing the Housing Elements of their General Plans. The RHNA does not necessarily encourage or promote growth, but rather allows communities to anticipate growth, so that they can grow in ways that enhance quality of life, improve access to jobs, transportation and housing, and not adversely impact the environment.

This region's RHNA is produced periodically by SCAG, as mandated by State law, to coincide with the region's schedule for preparing Housing Elements. It consists of two measurements of housing need: (a) existing need and (b) future need for very-low income, low-income, moderate and above-moderate income categories.

The existing need assessment is based on data from the most recent U.S. Census to measure ways in which the housing market is not meeting the needs of current residents. These variables include the number of low-income households paying more than 30 percent of their income for housing, as well as severe overcrowding.

The future need for housing is determined primarily by the forecasted growth in households in a community, based on historical growth patterns, job creation, household formation rates, and other factors to estimate how many households will be added to each community over the projection period. The housing need for new households is then adjusted to account for an ideal level of vacancy needed to promote housing choice, maintain price competition and encourage acceptable levels of housing upkeep and repair. The RHNA also accounts for units expected to be lost due to demolition, natural disaster, or conversion to non-housing uses. The sum of these factors household growth, vacancy need and replacement need form the "construction need" assigned to each community.

Finally, the RHNA considers how each jurisdiction might grow in ways that will decrease the concentration of low-income households in certain communities. The need for new housing is distributed among income groups so that each community moves closer to the regional average income distribution.

Local

Regional Comprehensive Plan (RCP). SCAG has also prepared and issued the 2008 RCP in response to SCAG's Regional Council directive in the 2002 Strategic Plan to define solutions to interrelated housing, traffic, water, air quality, and other regional challenges.[1] The 2008 RCP is an advisory document that describes future conditions if current trends continue, defines a vision for a healthier region, and recommends an Action Plan with a target year of 2035. The RCP may be voluntarily used by local jurisdictions in developing local plans and addressing local issues of regional significance. The plan incorporates principles and goals of the Compass Blueprint Growth Vision and includes nine chapters addressing land use and housing, transportation, air quality, energy, open space, water, solid waste, economy, and security and emergency preparedness. The action plans contained therein provide a series of recommended near-term policies that developers and key stakeholders should consider for implementation, as well as potential policies for consideration by local jurisdictions and agencies when conducting project review.

EXISTING SETTING

Table 3.10-1 shows the existing (2011) population, households, and employment numbers for each of the counties located within the SCAG region and the total for SCAG.

[1]SCAG, 2008 RCP website, http://www.scag.ca.gov/rcp/pdf/finalrcp/ f2008RCP_ExecSum.pdf, accessed May 26, 2011.

TABLE 3.10-1: 2011 POPULATION, HOUSEHOLDS, AND EMPLOYMENT IN THE SCAG REGION			
County	**2011 Population**	**2011 Households**	**2011 Employment**
Imperial	177,711	49,240	58,985
Los Angeles	9,894,657	3,250,864	4,148,186
Orange	3,045,507	1,001,689	1,497,913
Riverside	2,240,793	692,725	589,175
San Bernardino	2,066,502	614,402	643,691
Ventura	832,737	267,181	327,312
SCAG Region	**18,257,907**	**5,876,101**	**7,265,262**
SOURCE: SCAG Growth Forecasting, 2011.			

Population

The SCAG region is the second most populous metropolitan region in the nation. The U.S. Census reported the 2010 population (the most recent Census data available) of the SCAG region was 18,051,534. The California State Department of Finance estimates that the population of the region has since reached 18,163,664. Approximately six percent of the national population lives in the SCAG region, and for over half a century the region has been home to approximately half the population of California. **Table 3.10-2** shows the total population of the region, by decade, and the region's percentage of the total U.S. and California populations.

TABLE 3.10-2: SCAG POPULATION AND PERCENTAGE OF U.S. AND CALIFORNIA POPULATIONS, 1900 – 2010			
Year	**Population**	**Percentage of U.S. Population**	**Percentage of California Population**
1900	250,187	0.3%	16.9%
1910	661,907	0.7%	27.8%
1920	1,193,705	1.1%	34.8%
1930	2,657,969	2.2%	46.8%
1940	3,312,460	2.5%	48.0%
1950	4,997,221	3.3%	47.2%
1960	7,823,721	4.4%	49.8%
1970	10,055,351	4.9%	50.4%
1980	11,589,678	5.1%	49.0%
1990	14,640,832	5.9%	49.2%
2000	16,516,006	5.9%	48.8%
2010	18,051,534	5.8%	48.5%
SOURCE: U.S. Census Bureau, Decennial Census website, *http://factfinder2.census.gov*, accessed May 23, 2011.			

The population in the SCAG region increased by 1.7 million people between 2000 and 2011. This represents an increase of 10.6 percent (**Table 3.10-3**). In descending order, Riverside County grew by 45 percent (695,406 persons), Imperial County grew by 25 percent (35,350 persons), San Bernardino County grew by 21 percent (357,068 persons), Ventura County grew by 11 percent (79,540 persons), Orange County grew by seven percent (199,218 persons), and Los Angeles County grew by four percent (375,319 persons). Riverside County had the highest annual growth rate (4.09 percent) in the SCAG region.

TABLE 3.10-3: POPULATION GROWTH FOR 2000 AND 2011

County	2000 Population	2011 Population	2000-2011 Growth (Persons)	Percent Change (2000-2011)	Annual Growth Rate
Imperial	142,361	177,711	35,350	25%	2.26%
Los Angeles	9,519,338	9,894,657	375,319	4%	0.36%
Orange	2,846,289	3,045,507	199,218	7%	0.64%
Riverside	1,545,387	2,240,793	695,406	45%	4.09%
San Bernardino	1,709,434	2,066,502	357,068	21%	1.90%
Ventura	753,197	832,737	79,540	11%	0.96%
SCAG Region	**16,516,006**	**18,257,907**	**1,741,901**	**10.55%**	**0.96%**

SOURCE: SCAG, 2012-2035 RTP/SCS, Growth Forecast Appendix, Table 10, Page 21, 2011.

Household Size

Household size in the SCAG region decreased by approximately 0.11 of a person between 2000 and 2011, from 3.16 persons per household to 3.05 persons per household (**Table 3.10-4**). Average household size does not vary significantly from one county to another. In descending order, San Bernardino County and Riverside County household size grew, while Imperial County, Ventura County, Orange County and Los Angeles County household size declined between 2000 and 2011.

TABLE 3.10-4: HOUSEHOLD SIZE

County	2000	2011	2000-2011 Change (Persons)
Imperial	3.42	3.37	-0.05
Los Angeles	3.14	2.99	-0.15
Orange	3.06	3.00	-0.06
Riverside	3.09	3.18	0.09
San Bernardino	3.17	3.28	0.11
Ventura	3.11	3.06	-0.05
SCAG Region	**3.16**	**3.05**	**-0.11**

SOURCE: SCAG, 2012-2035 RTP.SCS, Growth Forecast Appendix, Table 6, Page 14, 2011.

Housing Characteristics

There were approximately 5.8 million households in the SCAG region in 2010 (**Table 3.10-5**). Los Angeles County accounts for nearly half of all households in the region.

Median household income in the SCAG region varies widely, from $37,458 in Imperial County to $77,539 in Ventura County. The county with the second highest median income is Orange County ($76,412). Across the SCAG region, the average median income is $59,155. Homeownership rates also vary, from a low of 48.6 percent in Los Angeles County to a high of 68.3 percent in Riverside County. The average homeownership rate in the SCAG region is 55.5 percent.

TABLE 3.10-5: 2010 HOUSING CHARACTERISTICS

County	Households	Median Household Income	Homeownership Rate
Imperial	49,126	$37,458	54.50%
Los Angeles	3,241,204	$55,811	48.60%
Orange	992,781	$76,412	61.50%
Riverside	686,260	$58,464	68.30%
San Bernardino	847,400	$56,539	63.90%
Ventura	266,920	$77,539	66.80%
SCAG Region	**5,847,909**	**$59,155**	**55.50%**

SOURCE: SCAG, *Profiles of Imperial County, Los Angeles County, Orange County, Riverside County, San Bernardino County, and Ventura County*, 2010. 2012-2035 RTP/SCS, Growth Forecast Appendix, Table 11, Page 21, 2011.

Employment

Employment trends in Southern California have long followed a "boom and bust" cycle. Much of the 2000's saw a boom of housing development, particularly, in the Inland Empire, only to be followed by a bust starting in 2008. This resulted in impacts to employment, particularly in the construction (housing) and service sectors. As shown in **Table 3.10-6**, only one county, Imperial, continues to show a net gain in jobs between 2000 and 2011. The remaining counties in the SCAG region, Orange, Los Angeles, Riverside, San Bernardino, and Ventura all show a negative employment growth, as does the SCAG region as a whole. As of 2011, employment in Imperial County grew by 20 percent (9,200 jobs). The counties with the highest employment loss (in increasing order of percent of lost employment) are: Orange County (5 percent), Los Angeles County (14 percent loss), San Bernardino County (16 percent loss), Riverside County (17 percent) and Ventura County (20 percent loss). Overall, the SCAG Region lost approximately 995,300 jobs (or 13 percent) between 2000 and 2011.

TABLE 3.10-6: EMPLOYMENT GROWTH FOR 2000 AND 2011

County	2000 (Jobs)	2011 (Jobs)	2000-2011 Growth (Jobs)	Percent Change (2000-2011)
Imperial	46,300	55,500	9,200	20%
Los Angeles	4,424,900	3,788,900	-636,000	-14%
Orange	1,429,100	1,361,900	-67,200	-5%
Riverside	644,200	535,500	-108,700	-17%
San Bernardino	704,000	588,100	-115,900	-16%
Ventura	374,900	298,200	-76,700	-20%
SCAG Region	**7,623,400**	**6,628,100**	**-995,300**	**-13%**

SOURCE: State of California, Employment Development Department, Labor Market Information Division, Industry Employment and Labor Force by Annual Average, March 2006 Benchmark, May 18, 2007. SCAG Growth Forecasting, 2011.

Unemployment

The 2010 (the most recent full year data available) unemployment rates in the SCAG region are among the highest in the country, exceeding the National and State average (9.5 percent and 12.4 percent, respectively). As shown in **Table 3.10-7**, in 2010 Imperial County had the highest unemployment rate in the SCAG region (almost 30 percent), while Orange County had the lowest in the SCAG region (9.6 percent, on par with the national average). In 2011, the average unemployment rate in the SCAG region was 15.3 percent. As shown in Table 3.10-7, the average year-to-date unemployment rates for 2011 show slightly lower unemployment rates for the entire SCAG region, State and Nation, indicating an increase in jobs.

TABLE 3.10-7: UNEMPLOYMENT RATES

County	2000 Unemployment Rate	Average 2011 Year-to-Date Unemployment (September 2011)
Imperial	17.4%	29.6%
Los Angeles	5.4%	12.2%
Orange	3.5%	8.6%
Riverside	5.4%	14%
San Bernardino	4.8%	12.9%
Ventura	4.5%	10.1%
SCAG Region	**6.8%**	**14.6%**
State Average	**4.90%**	**11.4%**
National Average	**4%**	**9.1%**

SOURCE: State of California Employment Development Department website, http://www.labormarketinfo.edd.ca.gov, accessed May 26, 2011; SCAG 2012-2035 RTP/SCS, Growth Forecast Appendix, Figure 1, Page 7

THRESHOLDS OF SIGNIFICANCE

Based on CEQA Appendix G and adapted for the Plan, the 2012-2035 RTP/SCS would have a significant impact related to population, housing, and employment if it would:

- Induce substantial population growth to areas of the region; and/or
- Require the acquisition of right-of-ways that would displace a substantial number of existing businesses or homes.

Methodology

This following summarizes the methodology used to evaluate the expected population, housing, and employment impacts of implementation of the 2012-2035 RTP/SCS in the SCAG region[2].

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality management District), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of population, housing, and employment includes a comparison of the expected future conditions with the Plan and the expected future conditions if no Plan were adopted (No Project). This evaluation is not included in the determination of the significance of impacts (which is based on a comparison to existing conditions); however, it provides a meaningful perspective on the effects of the 2012-2035 RTP/SCS.

Determination of Significance

The methodology for determining the significance of population, housing, and employment impacts compares the existing conditions to future (2035) conditions, as required in CEQA Section 15126.2(a).

The CEQA Guidelines require "growth-inducing" impacts to be discussed. Such impacts occur when the Plan could foster economic or population growth, or remove obstacles to growth. Growth inducing impacts include both changes in the amount and distribution of growth. This section analyzes the potential growth-inducing impacts of the 2012 RTP/SCS.

The 2012-2035 RTP/SCS consists of a combination of transportation policies, objectives, investments, and land use-transportation measures (see Chapter 2.0 Project Description of this PEIR for the Plan's goals,

[2]The Environmental Justice section of the Plan and associated appendix contains substantial analysis of gentrification and displacement impacts to low income, minority and other protected groups. See Environmental Justice Appendix of the 2012-2035 RTP/SCS. However, the PEIR does not rely on this analysis as it addresses displacement impacts as they affect the community as a whole, including loss of affordable housing.

policies transportation investments and land use policies). In addition, project growth forecasts were developed for a range of alternatives (see Chapter 4.0 Alternatives). For each alternative, differing sets of policies, objectives, and investments were applied. Alternative growth forecasts vary in their reliance on local input trend data and existing General Plans. The No Project Alternative includes only those programmed transportation projects that received federal environmental clearance by December 2011, projects in the 2011 FTIP and projects currently under construction or right of way approval. The growth forecast for the No Project Alternative relies exclusively on trend data adjusted to reflect 2012-2035 RTP/SCS growth totals. The 2008 Modified RTP Alternative is an update of the adopted 2008 RTP to reflect the most recent growth estimates and transportation planning decisions and assumptions, and the Envision 2 Alternative builds on the concentration of growth in the High Quality Transit Areas (HQTAs) as described in the Plan and goes further. It includes far more aggressive densities than the 2012-2035 RTP/SCS, especially around HQTAs, increases mobility, reduces emissions, and limits the development of single-family housing that would be built in the region. The No Project Alternative indicates the population, household, and employment distribution that could be expected without implementation of the 2012-2035 RTP/SCS. The 2035 population, households, and employment growth projections for each alternative are held constant at the regional level, but differ from one another in distribution of people, households, and jobs. Changes in investments and policies would shift the population distribution as a function of changes in mobility and land use decisions.

Projects in the 2012-2035 RTP/SCS were reviewed to identify those that may involve right-of-way acquisition and the potential for displacement of homes and businesses. Each project that might require acquisition of right-of-way was reviewed to generally identify locations that had the potential for large displacement of existing homes and businesses.

The potential for community disruption was assessed by evaluating the location of proposed projects in relation to surrounding land uses and community development. Highway and transit extensions and major interchange projects were assumed to have a higher potential to disrupt or divide existing communities since they would involve the creation of new roadways. Highway widening and other projects along established transportation rights-of-way were assumed to have a lower potential to divide or disrupt existing communities and neighborhoods.

The following analysis is based on general descriptions of projects in the Plan (see Chapter 2.0 Project Description and Appendix B 2012-2035 RTP/SCS Project List) and is regional and programmatic in nature. This section is intended to serve as a regional cumulative analysis for local jurisdictions in the preparation of project specific environmental documentation and to provide a framework for mitigation measures.

Implementation of the 2012-2035 RTP/SCS would affect the distribution of population, households, and employment. Expected significant impacts include substantial induced population growth in areas of the region adjacent to transit, right-of-way acquisitions that could displace a substantial number of existing businesses and homes, separation of residences from community facilities and services, and a cumulatively considerable impact on vacant natural lands.

Short-term construction-related impacts and long-term or permanent displacement, as well as off-site impacts from new facilities, would occur as a result of implementation of the 2012-2035 RTP/SCS. Indirect impacts from the changes in population distribution expected to occur due to the 2012-2035 RTP/SCS's transportation investments and land use policies are also identified.

IMPACTS

Impact 3.10-1 Potential to facilitate substantial population growth to some areas of the region.

Population Growth. As discussed in Chapter 2.0 Project Description, the 2012-2035 RTP/SCS growth scenario is based on local input with a redistribution of growth around HQTAs and other minor modifications. The population growth projection represents the expected amount and distribution of people that would occur in 2035 if the policies and investments included in the Plan were to be implemented. As shown in **Table 3.10-8,** the total SCAG region population is expected to increase by approximately 3.89 million persons upon buildout of the 2012-2035 RTP/SCS. The land use development pattern of the 2012-2035 RTP/SCS, which assumes a significant increase in small-lot, single- and multi-family housing, will mainly occur in infill locations near transit infrastructure (HQTAs). In some cases, the land use pattern assumes that more of these housing types will be built than is currently anticipated in local general plans, and in most cases, this shift in housing type—especially the switch from large-lot to small-lot single-family homes—will occur naturally in the marketplace as developers shift to products in high demand. In 2008, 45 percent of total housing units were multi-family products. The 2012-2035 RTP/SCS projects that in 2035, 68 percent of new homes in the SCAG region will be multi-family units.

Of the 648,000 new housing units expected in 2020, 28 percent will be at a minimum 30 dwelling units per acre; and of the 1.5 million new housing units expected in 2035, 34 percent will be at a minimum 30 dwelling units per acre. In accordance with Government Code Section 65080(b)(2)(B)(ii), these projected housing densities will help the region accommodate the projected housing needs at all income levels over the life of the 2012-2035 RTP/SCS, especially housing at the lower income categories. Additionally, SCAG moves towards improving the current distribution of households by income category in the region through the allocation of projected housing needs at the local level. After the final RHNA plan is adopted in October 2012, SCAG jurisdictions will revise their Housing Elements to meet their respective allocations. The SCS's strategies will inform the development of those Housing Elements.

TABLE 3.10-8: 2012 RTP/SCS POPULATION GROWTH PROJECTIONS (2035)

County	2011 Existing Population (Persons)	2035 Plan Projected Population (Persons)	Increase (Persons)
Imperial	177,711	288,200	110,489
Los Angeles	9,894,657	11,350,400	1,455,743
Orange	3,045,507	3,417,800	372,293
Riverside	2,240,793	3,380,900	1,140,107
San Bernardino	2,066,502	2,749,800	683,298
Ventura	832,737	958,700	125,963
SCAG Region	**18,257,907**	**22,145,800**	**3,887,893**

SOURCE: SCAG Growth Forecasting, 2011.

As significant changes occur in existing communities there is potential for "gentrification," or the displacement of lower-income residents if new development brings higher-income residents into a neighborhood. As the 2012-2035 RTP/SCS is implemented, jurisdictions in the SCAG region must be sensitive to the possibility of gentrification and work to employ strategies that can ameliorate it. One strategy is the general approach of higher-density infill development, which means that neighborhoods will be adding to the local housing stock rather than maintaining the current stock and simply changing the residential population. A second is the development of permanently affordable housing, through deed restrictions or development by nonprofit developers, which will ensure that some units will remain affordable to lower income households. SCAG will work with local jurisdictions and community stakeholders to seek resources and provide assistance to address any possible gentrification effects of new development on existing communities and vulnerable populations.

The 2012-2035 RTP/SCS land use development pattern accommodates over 50 percent of new housing and employment growth in HQTAs, while keeping jurisdictional totals consistent with local input. It moves the region towards more compact, mixed-use development leading to more opportunities for walking and biking, more transit use, and shorter auto trips. The 2012-2035 RTP/SCS includes 13 development types, which are used to meet the demand for a broader range of housing types, including the development of smaller-lot single-family homes, townhomes, and multi-family condominiums and apartments.

The transportation investments and urban form strategies in the proposed 2012-2035 RTP/SCS would foster substantial economic and household growth and would remove some obstacles to growth in some parts of the region. Specifically, the improved accessibility from the 2012-2035 RTP/SCS could help facilitate population and economic growth to areas of the region that are currently not developed. Therefore, implementation of the Plan would induce growth in some areas of the SCAG region. Implementation of Mitigation Measure **MM-POP1** would reduce impacts related to population growth; however, the impacts would remain significant.

Impact 3.10-2 Potential to require the acquisition of rights-of-way (ROW) that could displace a substantial number of existing homes and businesses.

In general, projects proposed in the 2012-2035 RTP/SCS would attempt to utilize existing rights-of-way (ROWs) to the maximum extent feasible. However, development of some highway, arterial, and transit projects proposed under the 2012-2035 RTP/SCS would result in the disturbance and/or loss of residential and business uses (notably the I-710 Gap Closure). In particular, the 2012-2035 RTP/SCS includes system expansion projects such as new freeway lane miles and new transit track miles that have the potential to result in the loss of land currently used for residential and business purposes. In past RTPs, SCAG has envisioned a system of truck-only lanes extending from the San Pedro Bay Ports to downtown Los Angeles along the I-710, connecting to an east-west segment, and finally reaching the I-15 in San Bernardino County. Significant progress towards a regional freight corridor system has continued as evidenced by recent work on an environmental impact report (expected to be completed in 2012) for the I-710 segment. As part of the 2012-2035 RTP/SCS, SCAG includes a refined concept for the east-west corridor component of the system and connections to an initial segment of I-15. After adoption of the 2012-2035 RTP/SCS, it is anticipated that significant additional study of alignments will be conducted, including an alternatives analysis completed as part of a full environmental review.

The East-West Freight Corridor would carry between 58,000 and 70,000 trucks per day. These are trucks that would be removed from adjacent general-purpose lanes and local arterial roads. These facilities, depending on the alignment, potentially would traverse through lands currently used for residential and business purposes. The final alignment would likely be adjacent to or concurrent with existing alignments, thus the adverse effects on displacing homes and businesses would be minimized. Additional goods movement projects included in the Plan such as grade separations also have the potential to displace homes or businesses as many of the areas where grade separations are proposed would be in developed urban areas.

SCAG's GIS was used to analyze where major freeway, rail, and transit projects, such as those described above, would intersect areas used for residential development and business uses. A 150-foot potential impact zone was drawn around the freeway, rail and transit projects in the 2012-2035 RTP/SCS to compute the number of acres that could potentially be affected by the construction and operation of project in the 2012-2035 RTP/SCS. **Table 3.10-9** shows the current land uses that are located within the 150 feet of either side of Plan projects.

TABLE 3.10-9: LAND USES AFFECTED BY PLAN PROJECTS

Land Use	No Project (Acres)	Plan (Acres)
Agriculture	60.88	1,604.80
Commercial	266.11	3,703.80
Education	45.47	282.19
Extraction	0.00	79.62
Facilities	46.06	536.37
Industrial	117.21	2,028.49
Low Density Residential	255.83	1,993.22
Medium to High Residential	97.13	1,048.38
Military Installations	0.66	489.59
Mixed Commercial and Industrial	8.02	103.55
Mixed Urban	0.06	26.41
Open Space and Recreation	184.71	732.72
Rural Density Residential	5.65	194.21
Transportation, Communications, and Utilities	1,869.39	3,912.95
Under Construction	1.62	161.59
Undevelopable	161.29	3.68
Unknown	0.69	27.70
Vacant	952.68	9,187.57
Water	0.30	77.98
Total	**4,073.77**	**26,194.81**

SOURCE: SCAG GIS Analysis, 2011; SCAG Land Use, 2008.

As indicated in **Table 3.10-9**, all types of residential and business uses would be impacted by Plan projects. In total, the 2012-2035 RTP/SCS includes 74,297 new lane miles including freeways, toll roads, major and minor arterials, collectors, and HOV lanes. These additional transportation facilities could displace homes and businesses in the region.

Additional residential and business lands would be affected by the growth associated with the 2012-2035 RTP/SCS. Implementation of Mitigation Measures **MM-POP2** and **MM-POP3** would reduce impacts related to population displacement; however, the impacts would remain significant.

Displacement of affordable housing in particular can have a negative impact on a community as these types of units may not be replaced. MM-POP4 could reduce impacts but not below a significant level.

Cumulative Impact 3.10-3: The 2012-2035 RTP/SCS will influence the pattern of growth in the region through transportation investments and land use strategies. These investments and land use strategies could contribute to a cumulatively considerable increase in population outside the region.

Implementation of the 2012-2035 RTP/SCS will result in an increase in population, housing and employment over the next 25 years, it is possible that the improved accessibility gained by transportation investments and key land use strategies could result in an increase in population in areas outside the region (as people find it easier to move from outside the region to employment centers within the region). If population increases to areas outside the SCAG region were in excess of forecasts and plans, it would be a significant impact. Therefore, the Plan would contribute to a cumulatively considerable population impact. Implementation of Mitigation Measures **MM-POP5** and **MM-POP6** would reduce cumulative impacts; however, the impacts would remain significant.

MITIGATION MEASURES

Mitigation Measures **MM-POP1, MM-POP5,** and **MM-POP6** shall be implemented by SCAG over the lifetime of the 2012-2035 RTP/SCS. Mitigation Measures **MM-POP2, MM-POP3** and **MM-POP4** can and should be implemented by project sponsors (for both development and transportation projects) as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions.

Population Growth

MM-POP1: SCAG shall work with its member agencies to implement growth strategies to create an urban form designed to focus development in HQTAs in accordance with the policies, strategies and investments contained in the 2012-2035 RTP/SCS, enhancing mobility and reducing land consumption.

Displacement

MM-POP2: For projects with the potential to displace homes and/or businesses, project sponsors can and should evaluate alternate route alignments and transportation facilities that minimize the displacement of homes and businesses. An iterative design and impact analysis would help where impacts to homes or businesses are involved. Potential impacts should be minimized to the extent feasible. If possible, existing rights-of-way should be used.

MM-POP3: Project sponsors can and should develop a construction schedule that minimizes potential neighborhood deterioration from protracted waiting periods between right-of-way acquisition and construction.

MM-POP4: Project sponsors shall mitigate impacts to affordable housing as feasible through construction of affordable units (deed restricted to remain affordable for an appropriate period of time) or payment of any fee established to address loss of affordable housing.

Cumulative

MM-POP5: SCAG's Compass Blueprint strategy will be used to build consensus in the region relating to changes in land use to accommodate future population growth while maintaining the quality of life in the region.

MM-POP6: SCAG shall work with neighboring planning agencies and MPOs to ensure plans and strategies can accommodate future population growth beyond SCAG's borders.

SIGNIFICANCE AFTER MITIGATION

Population Growth

Implementation of Mitigation Measure **MM-POP1** would reduce potential impacts related to population. In addition, the policies included in the 2012-2035 RTP/SCS seek to direct growth in a way that is efficient for both mobility and land consumption. However, implementation of the Plan would help induce growth to certain areas of the region. Therefore, this impact would remain significant.

Displacement

Implementation of Mitigation Measures **MM-POP2** through **MM-POP3** would reduce potential impacts related to displacement of residences and businesses. Not all of the projects included in the 2012-2035 RTP/SCS will be constructed in existing right-of-way. A substantial number of businesses and residences will likely be displaced due to development associated with projects in the 2012-2035 RTP/SCS. Therefore, this impact will remain significant. Mitigation Measure **MM-POP4** would help mitigate impacts to affordable housing.

Cumulative

Implementation of Mitigation Measures **MM-POP5** and **MM-POP6** would reduce potential impacts related to cumulative population, housing, and employment. However, the accessibility and afforded by the 2012-2035 RTP/SCS, and the expected shift in population, households and employment associated with the mobility benefits would change growth patterns in the region. Therefore, this impact would remain significant.

COMPARISON WITH THE NO PROJECT ALTERNATIVE

Given the location of the region, its mild climate and existing population trends, growth in the region is inevitable. **Table 3.10-10** shows the growth that would be expected to occur under the No Project Alternative and the Plan. In the No Project Alternative, the population of the SCAG region grows by the same number of people (approximately 3.89 million); however, no regional transportation investments are made other than existing programmed projects.

TABLE 3.10-10: 2035 POPULATION, HOUSEHOLDS, AND EMPLOYMENT IN THE SCAG REGION

	2035 Population		2035 Households		2035 Employment	
County	**No Project**	**Plan**	**No Project**	**Plan**	**No Project**	**Plan**
Imperial	288,200	288,200	90,800	90,800	121,100	121,100
Los Angeles	11,350,400	11,350,400	3,851,300	3,851,300	4,826,600	4,826,600
Orange	3,417,800	3,417,800	1,123,500	1,123,500	1,779,000	1,779,000
Riverside	3,380,900	3,380,900	1,091,500	1,091,500	1,236,800	1,236,800
San Bernardino	2,749,800	2,749,800	847,400	847,400	1,059,400	1,059,400
Ventura	958,700	958,700	318,400	318,400	413,200	413,200
SCAG Region	**22,145,800**	**22,145,800**	**7,322,900**	**7,322,900**	**9,436,100**	**9,436,100**

SOURCE: SCAG Growth Forecasting, 2011.

Direct Impacts

The No Project Alternative contains fewer transportation investments than the Plan. Consequently, there would be fewer places where businesses and homes would be displaced and fewer places where communities would be disrupted. The GIS analysis of existing land use data shows that the freeway, transit, and freight rail projects in the No Project Alternative would occur within 150 feet of 275 acres of business land uses (commercial, industrial, and extraction land uses) and 359 acres of residential land uses (rural, low, and medium to high density housing land uses). For the Plan, 3,834 acres of business land uses and 3,236 acres of residential land uses would be affected by transportation projects. The Plan impacts would be greater than the No Project Alternative impacts for Impacts 3.10-1, 3.10-2 and 3.10-3.

Cumulative Impacts

The No Project Alternative is expected to accommodate the same increases in total population as the Plan. However, the 2012-2035 RTP/SCS includes land use measures that would help reduce displacement and would target growth in developed urban areas. These mitigation measures are absent in the No Project Alternative. The 2012-2035 RTP/SCS also includes additional transportation improvements that facilitate access to currently vacant lands that would be less accessible with the No Project Alternative. This improved accessibility under the 2012-2035 RTP/SCS could encourage growth in previously undeveloped areas, however, land use strategies would aggressively seek to reduce consumption of vacant, open space/recreation and agricultural lands. The No Project Alternative could consume about 742 acres of vacant, open space/recreation and agricultural lands, while the 2012-2035 RTP/SCS would consume about 334 acres. Although the 2012-2035 RTP/SCS and the No Project Alternative would result in a different distribution of consumed land, they would result in the same total population, employment and households.

Because the Plan would facilitate coordinated planning efforts with neighboring planning agencies and would target growth in HQTAs and away from vacant lands, the No Project Alternative's cumulative impacts to population, households and employment could be greater than those of the 2012-2035 RTP/SCS.

3.11 PUBLIC SERVICES AND UTILITIES

This section describes the current public services and utilities in the SCAG region, discusses the potential impacts of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategies (2012-2035 RTP/SCS or Plan) on public services and utilities, identifies mitigation measures for the impacts, and evaluates the residual impacts.

In general, the impacts of the proposed project on public services are evaluated based on the adequacy of existing and planned facilities and personnel to meet any anticipated additional demand generated by the project.

POLICE, FIRE AND EMERGENCY SERVICES

REGULATORY FRAMEWORK

Federal

There are no federal police, fire and emergency services regulations applicable to the proposed project.

State

California Fire Code. Title 24, Part 9 of the California Code of Regulations (CCR) is the California Fire Code. Title 24, Part 9 of the CCR sets forth regulations regarding building standards, fire protection and notification systems, fire protection devices such as fire extinguishers and smoke alarms, high-rise building standards, and fire suppression training. The 2007 California Fire Code is the incorporation of the 2006 International Fire Code of the International Code Council with necessary California amendments. Development under the proposed project would be subject to applicable regulations of the California Fire Code.

Mutual Aid Agreements (MAA). Immediately following the 1994 Northridge earthquake, city and county emergency managers in the Office of Emergency Services (OES) coastal, southern, and inland regions developed a coordinated emergency management concept called the Emergency Managers Mutual Aid (EMMA) system. EMMA provided a valuable service in the emergency response and recovery efforts at the Southern Regional Emergency Operations Center (REOC), local Emergency Operations Centers (EOCs), the Disaster Field Office (DFO), and community service centers.

The purpose of EMMA is to support disaster operations in affected jurisdictions by providing professional emergency management personnel. In accordance with the Master Mutual Aid Agreement, local and state emergency managers have responded in support of each other under a variety of plans and procedures.

The objectives of the EMMA Plan include:

- Providing emergency management personnel from unaffected areas to support local jurisdictions, Operational Areas, and regional emergency operations during proclaimed emergencies;
- Providing a system, including an organization, information, and forms necessary to coordinate the formal request, reception, assignment, and training of assigned personnel;
- Establishing a structure to maintain this document (the Emergency Managers Mutual Aid Plan) and its procedures;

- Providing for the coordination of training for emergency managers, including Standardized Emergency Management System (SEMS/NIMS) training, emergency management course work, exercises, and disaster response procedures; and
- Promoting professionalism in emergency management.[1]

Local

County Offices of Emergency Services. Counties and cities are generally the first responders to any security or emergency situation. These responders include fire departments, police and sheriff department, hospitals, ambulance services and transportation agencies. Coordination among public and private agencies within various cities and counties make the most use of all available resources in the event of any emergency.

While each city and county has their own security procedures, the policies are generally similar. Mutual Aid agreements between cities, counties and private organizations help to maximize resources and reduce the human suffering associated with disaster situations. Each SCAG county has a department in charge of security and emergency response (**Table 3.11-1**).

TABLE 3.11-1: COUNTY OFFICES OF EMERGENCY SERVICES

County	Office Information	County	Office Information
Imperial	Office of Emergency Services 1078 Dogwood Road Heber, CA 92249 (760) 482-2400	Riverside	Office of Emergency Services 4080 Lemon Street, Suite 8 P.O. Box 1412 Riverside, CA 925021412 (951) 955-4700
Los Angeles	Office of Emergency Management 1275 N. Eastern Ave. Los Angeles, CA 90063 (323) 980-2261	San Bernardino	Office of Emergency Services 1743 W. Miro Way Rialto, CA 92376 (909) 356-3998
Orange	Office of Emergency Services 2644 Santiago Canyon Road Silverado, CA 92676 (714) 628-7055	Ventura	Ventura County Office of Emergency Services 800 South Victoria Ave. Ventura, CA 93009 (805) 654-2551

SOURCE: TAHA, 2011.

General Plan. The State of California requires every county and city to adopt a General Plan, which must contain a Safety Element. However, CCR Section 65302(g) specifically provides that a city may adopt the county's safety element if the county's element "is sufficiently detailed containing appropriate policies and programs for adoption by a city." The Safety Element must include methods to reduce the potential risk of fires, floods, earthquakes, landslides, and other hazards. Other locally relevant safety issues, such as emergency response, hazardous materials spills, and crime reduction, may also be included. Some local jurisdictions have also incorporated their hazardous waste management plans into their safety elements. In addition, the safety element may be used to establish programs and policies that promote neighborhood, institutional, governmental, and business safety. The safety element must identify and map urban fringe and rural-residential areas that are prone to wildfires, adequate evacuation routes and peakload water supplies to reduce fire hazards. The policies of the safety element form the basis of adopted fire safe ordinances and strategic fire defense system zoning.

[1] http://www.oes.ca.gov/Operational/OESHome.nsf/PDF/Emergency Managers Mutual Aid Plan/$file/Emma.pdf.

EXISTING SETTING

Fire Protection Services

Fire protection within the SCAG region includes a variety of federal, state, county, city, and other local fire protection agencies. As with police services, primary fire protection services occur at the community level, with city and county fire departments and fire protection districts providing this service. Also serving as fire protection services are a variety of volunteer fire companies. In addition, there are fire protection agencies that provide fire protection services within state and federal lands. These agencies include, but are not limited to, federal fire agencies (Bureau of Land Management, National Park Service, National Forest Service, Department of Defense, etc.), state forestry department, tribal fire departments, airport and harbor fire departments, and in some instances business sponsored fire departments (i.e., refineries, etc.). Each agency provides fire services within their own area of responsibilities, but they can call upon other agencies for fire support through mutual aid agreements. Generally, fire departments take proactive and preventative measures to provide fire suppression and emergency response services for all private, institutional, and public facilities within their area of responsibility. **Table 3.11-2** shows the breakdown of fire prevention agencies at the county and city levels. County service is for both unincorporated areas, cities that contract with the county for fire protection service, and independent fire protection districts.

TABLE 3.11-2: FIRE PROTECTION SERVICE PROVIDERS FOR JURISDICTIONS WITHIN SCAG COUNTIES

	Jurisdiction Served By		
County	**County Fire Department**	**City Fire Department**	**Fire Protection Districts or Other Independent Fire Agencies**
Imperial	2	6	4
Los Angeles	59	30	1
Orange	23	11	1
Riverside	19	8	5
San Bernardino	7	13	15
Ventura	7	4	--

Notes:
1. Numbers do not include various Federal, State, and specialty fire departments, such as Bureau of Land Management, National Park Service, Department of Defense, California Forestry Department (wild lands), private or public airport fire departments, business fire departments (i.e., refineries, Indian Tribal lands, etc.) that might aid county, city, and independent fire departments through mutual aid agreements, and vice versa.
2. Includes cities and unincorporated county areas served by county fire departments/authority.
3. Some districts service City and adjoining unincorporated areas.
4. Five Cities (Apple Valley, Barstow, Chino, Chino Hills, 29 Palms) served by independent fire protection districts.
5. City of La Habra served by LA County Fire Department.

SOURCE: http://www.imperialcounty.net/EmergencyPlans/MultiHazardMitigationPlan.pdf August 10, 2011; Los Angeles County Fire Department, Retrieved August 10, 2011 from http://www.fire.lacounty.gov/SpecialOps/SpecOps911Dispatch.asp; Orange County Fire Authority, http://www.ocfa.org/_uploads/pdf/ ocfiredepts.pdf, accessed August 15, 2011; Riverside County Fire Department, http://www.rvcfire.org/opencms/ ContractCities/, accessed August 15, 2011. San Bernardino County Fire Department, http://www.sbcfire.org/default.aspx, accessed August 15, 2011; City of San Bernardino Fire Department, http://sbcity.org/cityhall/fire/sbfd_facts.asp, accessed August 15, 2011; Ventura County Fire Department http://fire.countyofventura.org/AboutVCFD/tabid/60/Default.aspx, accessed August 15, 2011.

Police Protection Services

Law enforcement within the SCAG region takes into account a variety of federal, State, county, city, and other local law enforcement agencies. Primary law enforcement is at the community level, with City Police and Sheriff's Departments providing this service. Additionally, there are more specialized law enforcement agencies that assist in law enforcement at the community or resource level in the SCAG region. These specialized agencies include, but are not limited to State Highway Patrol, School Police, Airport and Harbor Police, Transit Police, Tribal Police, Park Rangers (federal, State, county, and city), and a wide variety of Federal Agencies (FBI, ATF, etc.). Each agency has their own responsibilities, some of which may overlap with other law enforcement agencies. State Park Rangers may call upon Sheriff's Deputies for assistance.

Transit Police might call upon City Police to aid them. In general, law enforcement agencies provide first response to all emergencies, perform preliminary investigations, and provide basic patrol services in their service area. **Table 3.11-3** shows the breakdown of law enforcement agencies at the county and city level. County service is for both unincorporated areas and cities that contract with the county for law enforcement services.

TABLE 3.11-3: POLICE SERVICE PROVIDERS FOR JURISDICTIONS WITHIN SCAG COUNTIES

	Jurisdiction Served By	
County	**County Sheriff's Department**	**City Police Department**
Imperial	1	7
Los Angeles	40	49
Orange	13	21
Riverside	10	11
San Bernardino	14	10
Ventura	6	5

Notes:
1. Includes Cities and Unincorporated County Areas served by County Sheriff's Departments.
2. Includes Cities that contract with other Cities for Police Services (i.e., Yorba Linda with Brea, Santa Fe Springs with Whittier, etc.).
3. Does not include specialty police agencies such as School Districts, Airports, Ports, etc.
SOURCE: Los Angeles County Sheriff's Department, http://www.lasd.org/lasd_services/contract_law/contract_cities.html , accessed August 15, 2011; Orange County Sheriff's Department, http://egov.ocgov.com/ocgov/Sheriff-Coroner%20-%20Sandra%20Hutchens, accessed August 15, 2011; Riverside County Sheriff's Department, http://www.riversidesheriff.org/stations/; San Bernardino Sheriff's Department, http://www.co.san-bernardino.ca.us/sheriff/patrol/Patrol.asp, August 15, 2011; Ventura County Sheriff's Department, http://www.vcsd.org/overview.php, accessed August 15, 2011.

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of CEQA and as appropriate for the 2012-2035 RTP/SCS, the Plan would have a significant impact related to police, fire and emergency services if it would:

- Create a substantial need within the region for construction of additional public facilities, such as fire and police stations.

Methodology

The following summarizes the methodology used to evaluate the expected impacts of implementation of the Plan on existing police, fire and emergency services, and associated environmental effects.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of police, fire and emergency services and facilities includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan were adopted (No Project). This evaluation is not included in the determination of the significance of impacts (which is based on a comparison to existing conditions); however it provides a meaningful perspective on the effects of the 2012-2035 RTP/SCS.

Determination of Significance

The public services analysis evaluates the police, fire and emergency services that are most likely to be affected by the implementation of the projects, programs, and policies identified in the Plan. Impacts to police, fire and emergency services were evaluated with SCAG data related to projected population, housing, and employment growth and available data on existing public services and utilities within the six-county region. The methodology for determining the significance of these impacts applies the significance criteria above to the expected future (2035) demand for police, fire and emergency services and compares future demand with the 2012-2035 RTP/SCS to the existing capacity for public services.

Both short-term construction related impacts and long-term or permanent impacts from new facilities would potentially result from implementation of the Plan. Implementation of the 2012-2035 RTP/SCS will affect public services and utilities. Expected significant cumulative impacts include demand for more police, fire, and emergency personnel and facilities. The following analysis identifies foreseeable impacts from new transportation projects proposed in the 2012-2035 RTP/SCS. Indirect, cumulative impacts from implementation of the proposed 2012-2035 RTP/SCS, in combination with increases in growth and development, are also identified. Project-specific impacts vary and appropriate mitigation measures would need to be developed on a project-by-project basis as appropriate.

IMPACTS

Impact 3.11-1: Potential to affect the level of transportation-related public services, such as police and fire/emergency personnel in the SCAG region.

Police, fire and emergency services within the SCAG region are provided by numerous agencies within multiple jurisdictions (**Tables 3.11-2** and **3.11-3**). Depending upon the timing, location, and duration of construction activities, several of the proposed projects, including grade crossings, arterials, interchanges, and auxiliary lanes, could delay emergency vehicle response times or otherwise disrupt delivery of emergency services. By closing off one or more lanes of a roadway, emergency routes would be impaired. The closure of these lanes could potentially cause traffic delays and ultimately prevent access to calls for service. While these impacts would be brief in nature, they are potentially significant. As part of project-specific environmental review, local agencies shall determine the degree of impact to emergency services.

Overall, project construction-related impacts to emergency vehicle response times and access could be reduced through adherence to road encroachment permits by the implementing agency. Traffic control plans should be prepared as part of the construction mitigation strategy to further reduce impacts on traffic and emergency response vehicles.

In addition, there is the potential need for increased fire, police, and emergency services at the construction sites of 2012-2035 RTP/SCS projects and at development sites in general for security and safety purposes. However, many construction sites are secured and have security onsite. The impact of individual construction sites on fire, police, and emergency services is anticipated to be short-term in nature however, given the large volume of projects and anticipated development construction would be on-going throughout

the lifetime of the RTP and would contribute to increased delays region-wide. In general the Plan would increase delay in the region by about 33 percent impacting response times of fire, police and emergency services.

There are several types of projects included within the 2012-2035 RTP/SCS that, upon completion, would require different levels of fire, police, and emergency services. Additional fire and police personnel would be needed to adequately respond to emergencies and routine calls, particularly on new or expanded transportation facilities. New light rail transit (LRT) routes/extensions in Los Angeles and San Bernardino Counties, as well as other transit-related projects, would involve the construction of transit stations. These transit stations, upon completion, would require fire, police, and emergency services. In some cases, such as with Metro, the governing transit authority provides security.

Increased use of transit would involve an increased need for fire, police, and emergency services for protection and rescue services. Any new transit police staff or facility that would be deemed necessary (by the project level CEQA documentation) will need to be funded by the appropriate transit authority, if necessary. Anticipated development would result in additional needs for police, fire and emergency services usually in direct proportion to population increase.

The 2012-2035 RTP/SCS anticipates a land use pattern where more than half of the new growth would be in urban areas, in particular in High Quality Transit Areas (HQTAs). As these urban areas increase in population, additional police, fire and emergency services would be required. The improvements to, and increased use of, non-motorized transportation methods such as bicycle routes and associated facilities, are anticipated to require minimal amounts of additional fire, police, and emergency services for security and safety.

Throughout the SCAG region, emergency service providers have historically accommodated increases in demand (with increased staff and facilities funded through general funds of each jurisdiction). New or expanded transportation facilities may increase the demand for emergency personnel and facilities potentially without increasing funding, resulting in a significant impact related to police, fire and emergency services. Increased development would increase demand for fire, police and emergency services; frequently tax revenues associated with development pays for increased services. Nonetheless tax revenue is not always sufficient and therefore impacts would remain significant. Implementation of Mitigation Measures **MM-PS1, MM-PS2 and MM-PS11** would reduce fire, police, and emergency services impacts; however, impacts would remain significant.

Impact 3.11-2: Potential to result in exposure to wildfires and hazards as new or expanded infrastructure is constructed within areas susceptible to these threats, resulting in an increased need for police, fire and emergency personnel.

As mentioned above, new or expanded transportation facilities may require additional fire, police, and emergency services as projects to close gaps in the highway network provide new sources of access to all parts of the SCAG region. Wildfires have been and will continue to be imminent threats to large portions of the SCAG region, as indicated in **Map 3.11-1**, located in Chapter 8.0. New 2012-2035 RTP/SCS infrastructure may be developed within areas susceptible to these hazards, thereby increasing the demand on fire and emergency services. In addition, climate change studies suggest that Southern California will continue to experience more extreme weather scenarios, including longer and hotter heat waves. These conditions would increase the threat of wildfire in parts of the SCAG region already prone to wildfires. According to current land use trends, it is anticipated that by 2035, 83,990 households would be located in areas prone to wildfire threat. However, the 2012-2035 RTP/SCS's compact growth pattern would focus growth in urban areas less likely to be threatened by wildfires. Under the Plan, it is expected that by 2035, the number of households located in areas prone to wildfires would be reduced to 71,553. Nonetheless, given the anticipated demand for fire, police, and emergency services from proposed 2012-2035 RTP/SCS

projects as well as increased development in general, and the current capacities of fire, police, and emergency services, an increased demand on these services is anticipated as a result of wildfire threat. Implementation of Mitigation Measures **MM-PS3** through **MM-PS10**, would reduce wildfire impacts; however, impacts would remain significant.

Cumulative Impact 3.11-3: Potential to contribute to regional cumulatively considerable impacts to the staffing level and response times of police, fire and emergency services in southern California.

In general impacts to police, fire and emergency services would be confined to the region and would result from transportation projects and anticipated growth. The increase in homes subject to wildfire threat could mean, that in the event of a major fire (such as the Station Fire in 2009), more homes would be in peril requiring more inter-agency assistance than might be needed under the Plan.

MITIGATION MEASURES

Mitigation Measures **MM-PS1** through **MM-PS6** can and should be implemented by project sponsors (for both development and transportation projects) as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions. Mitigation Measures **MM-PS7** through **MM-PS10** shall be implemented by SCAG and local jurisdictions can and should implement Mitigation Measures **MM-PS7** through **MM-PS11** over the lifetime of the 2012-2035 RTP/SCS.

MM-PS1: Project implementation agencies can and should ensure that prior to construction all necessary local and state road and railroad encroachment permits are obtained. The project implementation agency can and should also comply with all applicable conditions of approval. As deemed necessary by the governing jurisdiction, the road encroachment permits may require the contractor to prepare a traffic control plan in accordance with professional engineering standards prior to construction. Traffic control plans can and should include the following requirements:

- Identification of all roadway locations where special construction techniques (e.g., directional drilling or night construction) would be used to minimize impacts to traffic flow.
- Development of circulation and detour plans to minimize impacts to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone.
- Scheduling of truck trips outside of peak morning and evening commute hours.
- Limiting of lane closures during peak hours to the extent possible.
- Usage of haul routes minimizing truck traffic on local roadways to the extent possible.
- Inclusion of detours for bicycles and pedestrians in all areas potentially affected by project construction.
- Installation of traffic control devices as specified in the California Department of Transportation Manual of Traffic Controls for Construction and Maintenance Work Zones.
- Development and implementation of access plans for highly sensitive land uses such as police and fire stations, transit stations, hospitals, and schools. The access plans would be developed with the facility owner or administrator. To minimize disruption of emergency vehicle access, affected jurisdictions can and should be asked to identify detours for emergency vehicles, which will then be posted by the contractor. Notify in advance the facility owner or operator of the timing, location, and duration of construction activities and the locations of detours and lane closures.
- Storage of construction materials only in designated areas.

- Coordination with local transit agencies for temporary relocation of routes or bus stops in work zones, as necessary.

MM-PS2: Project sponsors can and should identify projects in the 2012-2035 RTP/SCS that require police protection, fire service, and emergency medical service and can and should coordinate with local fire and police departments to ensure that the existing public services would be able to handle the increase in demand for their services. If the current levels of services at the project site are found to be inadequate, infrastructure improvements and/or personnel requirements for the appropriate public service can and should be identified in each project's CEQA documentation.

MM-PS3: Project sponsors can and should ensure that during project construction, all construction vehicles and equipment will be fitted with spark arrestors to minimize accidental ignition of dry construction debris and surrounding dry vegetation.

MM-PS4: Project sponsors can and should encourage the use of fire-resistant vegetation native to Southern California and/or to the local microclimate (e.g., vegetation that has high moisture content, low growth habits, ignition-resistant foliage, or evergreen growth), eliminate brush and chaparral, and discourage the use of fire-promoting species especially non-native, invasive species (e.g., pampas grass, fennel, mustard, or the giant reed) in the immediate vicinity of development in areas with high fire threat.

MM-PS5: Project sponsors can and should encourage natural re-vegetation or seeding with local, native species after a fire and discourage re-seeding of non-native, invasive species to promote healthy, natural ecosystem re-growth. Native vegetation is more likely to have deep root systems that prevent slope failure and erosion of burned areas than shallow-rooted non-natives.

MM-PS6: Project sponsors can and should submit a fire safety plan (including phasing) to the Lead Agency and local fire agency for their review and approval. The fire safety plan can and should 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.

MM-PS7: SCAG shall and local jurisdictions can and should discourage development on potentially hazardous developments in hillsides, canyons, areas with steep slopes or that are susceptible to flooding, earthquakes, wildfire and other known hazards, and areas with limited access for emergency equipment.

MM-PS8: SCAG shall and local jurisdictions can and should promote Fire-wise Land Management: by encouraging the use of fire-resistant vegetation and the elimination of brush and chaparral in the immediate vicinity of development in areas with high fire threat.

MM-PS9: SCAG shall and local jurisdictions can and should shall promote Fire Management Planning that help reduce fire threats in the region as part of the Compass Blueprint process and other ongoing regional planning efforts.

MM-PS10: SCAG shall and local jurisdictions can and should encourage the use of fire-resistant materials when constructing projects in areas with high fire threat.

MM-PS11: The growth inducing potential of individual RTP projects shall be carefully evaluated so that the full implications of the projects are understood. Individual environmental documents shall quantify indirect impacts (growth that could be facilitated or induced) on public services and utilities to the extent feasible. Lead and responsible agencies can and should then make any necessary adjustments to the applicable General Plan. Any such identified adjustment shall be communicated to SCAG.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Police, Fire and Emergency Services

Impacts to police, fire and emergency services in the SCAG region would be significant without mitigation. Implementation of Mitigation Measures **MM-PS1** and **MM-PS2** would reduce these impacts; however, impacts would remain significant.

Wildfire Hazards

Impacts related to wildfire hazards would be reduced with the implementation of Mitigation Measures **MM-PS3** through **MM-PS10**. However, wildfires and seismic events are, and will continue to be imminent threats to large portions of the SCAG region, regardless of any available preventative measures. Therefore, this impact would remain significant.

Cumulative Impacts

Implementation of Mitigation Measure **MM-PS11** would reduce growth-related increased demand for police, fire, and emergency services in the SCAG region. However, impacts to fire services would remain potentially significant.

COMPARISION WITH THE NO PROJECT ALTERNATIVE

Under the No Project Alternative, the population of the SCAG region would grow by 3.9 million people (the same as for the Plan); however no regional transportation investments would be made above the existing programmed projects. The population distribution could follow past trends, substantially uninfluenced by additional transportation investments.

Direct Impacts

There would be increased congestion under the No Project Alternative because of fewer transportation improvements and a more dispersed growth pattern. Therefore, the No Project Alternative would result in emergency vehicle response times that are worse than under the Plan. On average delay in the region would increase by 83 percent from 2011 under the No Project Alternative as compared to an increase of about 33 percent with the Plan. Under the No Project Alternative, new growth would be spread over about 474,880 acres of vacant, open space/recreational and agricultural lands compared to about 213,760 under the Plan. Thus greater extension of fire and police protection and emergency services would be needed under the No Project Alternative.

As mentioned above, under the No Project Alternative, it is anticipated that 83,990 households would be exposed to extreme wildfire threats; whereas under the 2012-2035 RTP/SCS, the number would be reduced to 71,553. This would be a 14 percent decrease in households exposed to extreme wildfire threats, as

measures to reduce wildfire threats are implemented with planned 2012-2035 RTP/SCS projects. **The No Project Alternative would result in impacts that would be greater than the Plan for Impact 3.11-1 and 3.11-2.**

Cumulative Impacts

In general impacts to police, fire and emergency services would be confined to the region and would result from transportation projects and anticipated growth. The increase in homes subject to wildfire threat could mean, that in the event of a major fire (such as the Station Fire in 2009), more homes would be in peril requiring more inter-agency assistance than might be needed under the Plan. **The No Project impacts would be greater than the Plan impacts for Impact 3.11-3.**

EDUCATIONAL FACILITIES

REGULATORY FRAMEWORK

Federal

There are no federal public school regulations applicable to the proposed project.

State

California Government Code Section 65995. California Government Code Section 65995 is found in Title 7, Chapter 4.9 of the California Government Code. California Government Code Section 65995 authorizes school districts to collect impact fees from developers of new residential and commercial/industrial building space. Senate Bill 50 (SB 50) amended Government Code Section 65995 in 1998. Under the provisions of SB 50 schools can collect fees to offset costs associated with increasing school capacity as a result of development. The development associated with the proposed project would be subject to applicable fees determined by the local school districts per California Government Code Section 65995. The local school districts determine fees in accordance with California Government Code Section 65995 which can be adjusted every two years.

California Education Code. School facilities and services are subject to the rules and regulations of the California Education Code and governance of the State Board of Education (SBE). The SBE is the 11-member governing and policy making body of the California Department of Education (CDE) that sets K-12 education policy in the areas of standards, instructional materials, assessment, and accountability. The CDE and the State Superintendent of Public Instruction are responsible for enforcing education law and regulations; and for continuing to reform and improve public elementary school, secondary school, and child care programs, as well as adult education and some preschool programs. The CDE's mission is to provide leadership, assistance, oversight, and resources so that every Californian has access to an education that meets world-class standards.[2] The core purpose of the CDE is to lead and support the continuous improvement of student achievement, with a specific focus on closing achievement gaps.[3]

[2]California Department of Education, Role and Responsibilities, accessed online at: http://www.cde.ca.gov/ eo/mn/rr/, accessed April 5, 2010.

[3]California Department of Education, Belief and Purpose, accessed online at: http://www.cde.ca.gov/ eo/mn/mv/, accessed April 5, 2010.

Leroy F. Green School Facilities Act of 1998 (Senate Bill (SB) 50). The Leroy F. Greene School Facilities Act of 1998, Senate Bill (SB) 50, was signed into law on August 27, 1998. It placed a $9.2 billion State bond measure (Proposition 1A), which included grants for modernization of existing schools and construction of new schools, on ballot at the November 3, 1998 election. Under SB 50, a program for funding school facilities largely based on matching funds was created. Its construction grant provides funding on a 50/50 State and local match basis, while its modernization grant provides funding on a 60/40 basis. Districts that are unable to provide some, or all, of the local match requirement and area able to meet the financial hardship provisions may be eligible for additional State funding.[4] In addition, SB 50 allows governing boards of school districts to establish fees to offset costs associated with school facilities made necessary by new construction. Pursuant to Government Code Section 65995, the payment of these fees by a developer serves to fully mitigate all potential project impacts on school facilities from implementation of a project to less than significant levels.

Local

School Districts. Although the California public school system is under the policy direction of the Legislature, the California Department of Education relies on local control for the management of school districts. In allocating resources among the schools of the district, school district governing boards and district administrators must follow the law, but also set the educational priorities for their schools. As of the 2008-2009 school year, there were more than 1,000 school districts in California.

EXISTING SETTING

Educational Facilities

There are approximately 3.1 million students enrolled in schools in the SCAG region, ranging from kindergarten to twelfth grade, with approximately 143,000 teachers. **Table 3.11-4** lists the public school student and teacher totals by county. **Table 3.11-5** shows the number of school districts along with both public and private schools in the SCAG region by county.

TABLE 3.11-4: KINDERGARTEN THROUGH GRADE 12 ENROLLMENT AND TEACHERS IN THE SCAG REGION FOR THE 2011-2011 SCHOOL YEAR

County	Enrollment K-12	Teachers
Imperial	36,435	1,570
Los Angeles	1,589,543	79,494
Orange	502,903	20,266
Riverside	425,334	16,762
San Bernardino	417,214	18,870
Ventura	141,610	6,180
SCAG Region	3,113,039	143,142
California	6,217,113	291,594

SOURCE: California Department of Education, Educational Demographics Unit. (August, 2011). Enrollment in California public schools by county 2010-2011 [Data Query] and Number of teachers in California public schools by ethnicity by county 2010-11 [Data Query], accessed August 10, 2011 from the California Department of Education Web site, http://dq.cde.ca.gov/dataquest/.

[4] State of California, Office of Public School Construction, School Facility Program Handbook, February 2006.

TABLE 3.11-5: PUBLIC AND PRIVATE SCHOOLS IN THE SCAG REGION

	Public Schools						Private Schools	
	K-12		Community College					
County	Districts	Schools	Districts	Schools	UC System	Cal State System	K-12	College
Imperial	17	66	1	1	--	--	8	--
Los Angeles	88	2,167	13	22	1	5	975	41
Orange	28	620	4	9	1	1	283	9
Riverside	25	491	4	6	1	--	136	2
San Bernardino	34	559	5	6	--	1	153	2
Ventura	21	224	1	3	--	1	82	3
Total	**213**	**4,127**	**28**	**47**	**3**	**8**	**1,637**	**57**

SOURCE: California Department of Education, DataQuest, http://dq.cde.ca.gov/dataquest/content.asp, accessed August 11, 2011.
The California State University, *Campus Home Pages*, http://www.calstate.edu/datastore/campus_map.pdf, accessed August 11, 2011.
The California State University website, http://www.universityofcalifornia.edu/campuses/welcome.html, accessed August 11, 2011.
California Department of Education, School Directory, http://www.cde.ca.gov/re/sd/, accessed August 11, 2011.
Western Association of Schools and Colleges, http://www.wascsenior.org/wasc/, accessed August 11, 2011.

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of CEQA and as appropriate for the 2012-2035 RTP/SCS, the Plan would have a significant impact related to schools facilities if it would:

- Create a substantial need within the region for construction of additional schools.

Methodology

The following summarizes the methodology used to evaluate the expected impacts of implementation of the Plan on existing educational facilities and associated environmental effects.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of educational facilities includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan were adopted (No Project). This evaluation is not included in the determination of the significance of impacts (which is based on a comparison to existing conditions); however it provides a meaningful perspective on the effects of the 2012-2035 RTP/SCS.

Determination of Significance

The following analysis evaluates educational facilities that could be affected by the implementation of the projects, programs, and policies identified in the Plan. Impacts to educational facilities were evaluated with SCAG data related to projected population, housing, and employment growth and available data on public services within the six-county region. The methodology for determining the significance of these impacts applies the significance criteria above to the expected future (2035) demand for educational facilities and compares future demand with the Plan to the existing capacity.

Both short-term construction related impacts and long-term or permanent impacts could result from implementation of the Plan.

The following analysis identifies direct, indirect and cumulative impacts that would occur with implementation of the Plan. There is anticipated to be wide variation in project specific impacts and mitigation measures should be developed as appropriate on a project-by-project basis.

IMPACTS

Impact 3.11-4: Potential to increase demand for school facilities.

Population in the SCAG region is anticipated to increase by approximately 3.9 million people over the next 25 years (with or without the Plan). The population of school-aged children (5-17) is anticipated to increase by approximately 453,000. The transportation investments and land use strategies in the 2012-2035 RTP/SCS target development in urbanized portions of the region, specifically near transit and other existing infrastructure. It is anticipated that this increase in school-aged children would result in a significant impact to schools in the region. Implementation of Mitigation Measure **MM-PS12** would reduce impacts to educational facilities; however, impacts would remain significant.

Cumulative Impact 3.11-5: Potential to contribute to a cumulatively considerable demand for schools that exceeds capacity.

It is not anticipated that the Plan would contribute to cumulative impacts to schools beyond the project-specific impacts identified above. It is anticipated that some changes in population could be induced outside the region as a result of the Plan, such changes would be addressed by planning efforts in those jurisdictions.

MITIGATION MEASURES

Mitigation Measure **MM-PS12** can and should be implemented by project sponsors as applicable.

MM-PS12: Project sponsors can and should undertake project-specific review of the impacts to educational facilities as part of project specific environmental review. For any identified impacts, project sponsors can and should ensure that the appropriate school district fees are paid in accordance with State law. The project sponsors or local jurisdiction can and should be responsible for ensuring adherence to required mitigation. SCAG should be provided with documentation of compliance with any necessary mitigation measures.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Schools

Implementation of Mitigation Measure **MM-PS12** would reduce impacts related to demand for new schools and teachers. However, impacts would remain significant.

COMPARISION WITH THE NO PROJECT ALTERNATIVE

Direct Impacts

Under the No Project Alternative, the population of the SCAG region would grow by 3.9 million people; however, no regional transportation investments would be made above the existing programmed projects and the land use strategies included in the Plan would not be in place in the region. The population distribution would likely follow past trends, uninfluenced by additional transportation investments or land use strategies.

Cumulative Impacts

The No Project Alternative would result in a different distribution of demand for schools (more dispersed). It is not clear if this impact would be better or worse than under the Plan. Therefore, impacts are anticipated to be similar.

RECREATIONAL FACILITIES

See also Section 3.3 Biological Resources and Open Space.

REGULATORY FRAMEWORK

Federal

Section (4f). Section 4(f) of the U.S. Department of Transportation Act of 1966 (U.S. DOT Act) was enacted as a means of protecting publicly-owned public parks, recreation areas, and wildlife/waterfowl refuges as well as historic sites of local, state or national significance, from conversion to transportation uses.

The provision states that the Secretary of the U.S. DOT may approve a transportation project requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge, or land from an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, recreation area, refuge or site) only if:

- There is no feasible and prudent alternative to using that land, and
- The program or project includes all possible planning to minimize harm to the Section 4(f) property.

- or –

- The Section 4(f) use is de minimis.

State

Quimby Act. The Quimby Act was established by the California State Legislature in 1965 and codified as California Government Code Section 66477. The Quimby Act allows the legislative body of a city or county, by ordinance, to require the dedication of land or impose a requirement of the payment of fees in lieu thereof, or a combination of both, for park or recreational purposes as a condition to the approval of a tentative tract map or parcel map. Under the Quimby Act, requirements for parkland dedications are not to exceed three acres of parkland per 1,000 persons residing within a subdivision, and in-lieu fee payments shall not exceed the proportionate amount necessary to provide three acres of parkland, unless the amount of existing neighborhood and community parkland exceeds that limit.

California Department of Parks and Recreation (CDPR). The CDPR manages and provides sites for a variety of recreational and outdoor activities. The CDPR is a trustee agency that owns and operates all state parks and participates in land use planning that affects state parkland.

Local

General Plans. The most comprehensive land use planning, including that for recreational facilities in the SCAG region is provided by city and county general plans, which local governments are required by state law to prepare as a guide for future development. General plans contain goals and policies concerning topics that are mandated by state law or which the jurisdiction has chosen to include. Required topics are land use, circulation, housing, conservation, open space, noise, and safety. Other topics that local governments frequently choose to address are public facilities, parks and recreation, community design, and growth management, among others. City and county general plans must be consistent with each other. County general plans must cover areas not included by city general plans (i.e., unincorporated areas).

Specific and Master Plans. A city or county may also provide land use planning by developing community or specific plans for smaller, more specific areas within their jurisdiction. These more localized plans provide for focused guidance for developing a specific area, with development standards tailored to the area, as well as systematic implementation of the general plan.

Zoning. City and county zoning codes provide the set of detailed requirements that implement general plan policies at the level of the individual parcel. Zoning codes present standards for different uses and identifies which uses are allowed in the various zoning districts of the jurisdiction. Since 1971, State law has required the city or county zoning code to be consistent with the jurisdiction's general plan.

EXISTING SETTING

Community Open Space and Recreation

Community open space includes all forms of open space in or serving the needs of people in the region's communities. This category includes, but is not limited to park and recreation areas, community gardens, some private farmlands, some public rangelands, urban forests, greenbelts, and trail systems. In many communities, it also includes natural lands in the form of cores, connectors, and/or fragments.

Community open space traditionally has meant parks and other recreation areas that are located in or near enough to serve local communities. In today's region, community open space includes community gardens, dedicated natural lands, urban forests, greenbelts, trail systems, and bikeways. This new mix of community open spaces is the product of interrelated planning decisions on a local and regional level and a reflection of new and old needs of the region's communities. **Table 3.11-6** shows the acreage of recreational facilities and open space with each SCAG subregion.

TABLE 3.11-6: RECREATIONAL AREAS BY SCAG SUBREGION (ACRES)[a],[b]

SCAG Subregion	Beach Parks	Developed Local and Regional Parks	Specimen Gardens/ Arboreta	Undeveloped Local and Regional Parks	Wildlife Preserves and Sanctuaries	Other Open Space and Recreation	Total
Ventura County	220	383	1	0	1,802	626,933	**629,339**
North Los Angeles County	0	705	0	5,268	849	2,010	**8,832**
Las Virgines, Malibu	181	73	0	713	28	66	**1,060**
South Bay Cities	176	376	82	0	52	69	**755**
City of Los Angeles	229	480	0	139	432	219	**1,500**
Westside Cities	136	410	0	151	0	107	**805**
Arroyo Verdugo	0	8	144	0	0	153	**306**
Gateway Cities	240	2,086	4	691	65	164	**3,250**
San Gabriel	0	1,579	272	2,136	34	3,373	**7,395**
Orange County	682	2,201	0	57	10,678	5,387	**19,005**
Western Riverside	0	1,636	4	24,689	3,351	6,785	**36,474**
Coachella Valley	0	755	1	667,309	10,971	993	**680,029**
San Bernardino County	0	1,616	0	121,420	6	6,968	**130,010**
Imperial County	0	114	0	0	10,735	864	**11,713**
Total	**1,864**	**12,422**	**508**	**822,573**	**39,003**	**654,091**	**1,530,473**

[a] "Open" uses include open space and recreation lands, water, vacant lands in a natural state, and agriculture.
[b] Does not include national forests, state parks, and other federal/state lands that are kept in a natural state and are open to the public for recreational purposes.
Note: Acreage based on 2008 data.
SOURCE: SCAG GIS Analysis 2011; SCAG 2008 Land Use Inventory.

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of CEQA and as appropriate for the 2012-2035 RTP/SCS, the Plan would have a significant impact related to recreational facilities if it would:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facilities would occur; and/or
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the Plan on existing recreational facilities and associated environmental effects.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all

transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of recreational facilities includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan were adopted (No Project). This evaluation is not included in the determination of the significance of impacts (which is based on a comparison to existing conditions); however it provides a meaningful perspective on the effects of the 2012-2035 RTP/SCS.

Determination of Significance

The following analysis evaluates recreational facilities that are most likely to be affected by the implementation of the projects, programs, and policies identified in the Plan. Impacts to these facilities were evaluated with SCAG data related to projected population, housing, and employment growth and available data on public services within the six-county region. The methodology for determining the significance of these impacts applies the significance criteria above to the expected future (2035) demand for recreational facilities and compares future demand with the Plan to the existing capacity.

Both short-term construction related impacts and long-term or permanent impacts could result from implementation of the Plan. Below are descriptions of the types of direct impacts foreseeable from new transportation projects and development anticipated in the 2012-2035 RTP/SCS. Indirect, and cumulative impacts from implementation of the Plan are also addressed. Project specific impacts may vary and mitigation measures should be developed on a project-by-project basis as appropriate.

IMPACTS

Impact 3.11-6: Potential to result in a substantial loss or disturbance of existing open space and recreational lands.

The 2012-2035 RTP/SCS includes projects that would require the acquisition or development of previously undisturbed/vacant land and/or designated open space potentially resulting in a significant impact.

Open spaces vary in size and location as described in the Environmental Setting and generally include public parks, recreational facilities, and areas planned for such uses. (It also includes agricultural lands and vacant land with no designated use; these uses are discussed in Section 3.8 Land Use.) Most open spaces provide critical habitat, as discussed in Section 3.3 Biological Resources. Construction of transportation facilities as well as development would impact open spaces and recreational lands (and possibly recreational facilities), through the acquisition of land and development of transportation projects and urban uses.

Transit and some roadway improvements included in the 2012-2035 RTP/SCS are generally located in urbanized areas, and therefore, are not likely to result in significant impacts to vacant/undisturbed lands or large tracts of land designated as open space. Although such projects could impact local recreational facilities such as local parks, gymnasiums, swimming pools, etc.).

To assess potential impacts to open space adjacent to transportation corridors, Geographic Information Systems (GIS) was used to analyze major highway, transit, and freight rail project in the 2012-2035 RTP/SCS. The results of the GIS analysis determined that projects included in the Plan could affect 733

acres of open space and recreational land throughout the SCAG region.[5] Urban development would impact considerably more open space. The Plan would consume 334 square miles (213,800 acres) of land not presently in urban use.

Under the 2012-2035 RTP/SCS, more than half of new growth occurring would be infill or redevelopment, with the remainder located on previously vacant/undeveloped land, open space and recreational lands, or farmland. Proposed projects that could result in significant impacts to recreational facilities include closures to gaps in the highway network through areas that currently serve as open space lands, closures to gaps in the high-occupancy vehicle (HOV) lane network and the addition of freeway-to-freeway direct HOV connectors, and a connected network of express/high-occupancy toll (HOT) lanes.

Corridor projects, in particular, would be expected to result in impacts to open spaces due to acquisition of large amounts of land for roadway widening and construction and also due to degrading existing habitat by adding transportation infrastructure to areas that previously had habitat value. Projects that would be expected to include substantial impacts to loss of open space to accommodate large increases in traffic include the High Desert Corridor in Los Angeles and San Bernardino Counties and SR-241 in Orange County. The Plan includes a policy on Acquisition of Natural Lands and Open space which may lead to reduced loss of open space over the long term.

In addition, the 2012-2035 RTP/SCS includes arterial investments, goods movement capacity enhancements, and the California High-Speed Train (HST). These projects would cause adverse effects on open space and recreation lands. Implementation of Mitigation Measures **MM-PS13** through **MM-PS20** would reduce impacts to open space and recreational facilities; however, impacts would remain significant.

Impact 3.11-7: Potential to increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facilities would occur.

The 2012-2035 RTP/SCS includes transportation investments and land use strategies that would affect the pattern of development in the region. With the Plan, total population is expected to increase by approximately 3.9 million by 2035. As described above, the 2012-2035 RTP/SCS would target growth in existing urban areas. Many of the urbanized areas in the SCAG are currently deficient in park space. Although policies included in the Plan encourage additional parks and other amenities, many of the areas where population would be expected to increase would be areas without sufficient park space, resulting in increased use and deterioration of existing neighborhood and regional parks.

As discussed under **Impact 3.11-6** above, the 2012-2035 RTP/SCS also includes projects that could result in the acquisition of parks and recreational facilities, further increasing use at remaining facilities and further reducing the ratio of parks-to-people in these urban areas. Implementation of Mitigation Measures **MM-PS21** through **MM-PS34** would reduce impacts to recreational facilities; however, impacts would remain significant. The Environmental Justice section includes a substantial analysis on the access to open space for Environmental Justice communities and associated health impacts.

MITIGATION MEASURES

Mitigation Measures **MM-PS13** through **MM-PS26** can and should be implemented by project sponsors and local agencies as appropriate (for both development and transportation projects) and local jurisdictions as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375

[5]Based on SCAG Land Use data from 2008.

can and should apply mitigation measures as appropriate to site-specific conditions. Mitigation Measures **MM-PS27** through **MM-PS34** shall be implemented by SCAG over the lifetime of the 2012-2035 RTP/SCS.

MM-PS13: Project sponsors can and should ensure that projects are consistent with federal, state, and local plans that preserve open space.

MM-PS14: Project sponsors can and should consider corridor realignment, buffer zones and setbacks, and berms and fencing where feasible, to avoid open space and recreation land and to reduce conflicts between transportation uses and open space and recreation lands.

MM-PS15: Project sponsors can and should identify open space areas that could be preserved and shall include mitigation measures (such as dedication or payment of in-lieu fees) for the loss of open space.

MM-PS16: Prior to final approval of each project, the project sponsor can and should conduct the appropriate project-specific environmental review, including consideration of loss of open space. Potential significant impacts to open space shall be mitigated, as feasible. The project sponsors or local jurisdiction can and should be responsible for ensuring adherence to the mitigation measures prior to construction.

MM-PS19: Local jurisdictions can and should prepare a Needs Assessment to determine the level of adequate community open space level for their areas.

MM-PS20: Local jurisdictions can and should work with SCAG to identify regionally significant open space resources within their jurisdictions as feasible and appropriate.

MM-PS21: Where practical and feasible, project sponsors and local jurisdictions can and should consider increasing the accessibility to natural areas and lands for outdoor recreation. Such measures can and should be coordinated with local and regional open space planning or management agencies.

MM-PS22: Local jurisdictions can and should encourage multiple use spaces and encourage redevelopment in areas where it will provide more opportunities for recreational uses and access to natural areas close to the urban core.

MM-PS23: Project level mitigation for significant cumulative and growth-inducing impacts on open space resources can and should include the conservation of natural lands, community open space and important farmland through existing projects in the region.

MM-PS24: Local governments can and should consider the most recent annual report on open space conservation in planning and evaluating projects and programs in areas with regionally significant open space resources.

MM-PS25: Local governments can and should encourage patterns of urban development and land use, which reduce costs on infrastructure and make better use of existing facilities. Strategies local governments can and should pursue include:

- Increase the accessibility to natural areas lands for outdoor recreation.
- Promote infill development and redevelopment to revitalize existing communities
- Utilize "green" development techniques
- Promote water-efficient land use and development.

MM-PS26: Project sponsors and local governments can and should encourage multiple use spaces and encourage redevelopment in areas where it will provide more opportunities for recreational uses and access to natural areas close to the urban core.

MM-PS27: Future impacts to open space and recreation lands shall be avoided through cooperation, information sharing, and program development as part of SCAG's ongoing regional planning efforts.

MM-PS28: SCAG shall support local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection.

MM-PS29: SCAG shall encourage member jurisdictions to work as partners to address regional outdoor recreation needs and to acquire the necessary funding for the implementation of their plans and programs. This should be done, in part, by consulting with agencies and organizations that have active open space work plans.

MM-PS30: SCAG shall support local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection.

MM-PS31: SCAG shall coordinate with local agencies facilitate planning and funding opportunities for regional open space.

MM-PS32: SCAG shall continue to work with the state to develop approaches for evaluating environmental impacts within the Compass Blueprint program, particularly energy, air quality, water, and open space and habitat.

MM-PS33: SCAG shall encourage member jurisdictions that have trails and trail segments determined to be regionally significant to work together to support regional trail networks. SCAG should encourage joint use of utility, transportation and other rights-of-way, greenbelts, and biodiversity areas

MM-PS34: SCAG shall consider consistency with ongoing regional open space planning in funding opportunities and programs administered by SCAG.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Loss of Open Space and Recreational Lands

Implementation of Mitigation Measures **MM-PS13** through **MM-PS34** would help to reduce impacts related to loss or disturbance of open space and recreational lands; however, it is anticipated that impacts to open space and recreational lands would not be mitigated in every instance. Therefore, this impact would remain significant.

Potential to Impact Existing Recreational Facilities

Implementation of Mitigation Measures **MM-PS 21** through **MM-PS 34** would reduce impacts related to the loss or overuse of parks and recreational facilities in urbanized areas. However, as more than half of the growth that would occur in the region would be in these urbanized areas, this impact would remain significant.

COMPARISION WITH THE NO PROJECT ALTERNATIVE

In the No Project Alternative, the population of the SCAG region grows by 3.9 million people, however, no regional transportation investments would be made above the existing programmed projects. The population distribution could follow past trends, uninfluenced by additional transportation investments.

Direct Impacts

The No Project Alternative includes fewer transportation projects than the 2012-2035 RTP/SCS and does not include land use strategies beyond those put in place by local jurisdictions. Thus, transportation projects included in the No Project Alternative would be expected to directly consume or disturb fewer acres of agricultural lands and open space as compared to the Plan. The results of the GIS analysis indicate that projects included in the Plan would directly affect 733 acres of open space and recreational land, as compared to 185 acres under the No Project Alternative. However development anticipated under the Plan would consume only 334 square miles (212,800) as compared to 742 square miles (479,900 acres) anticipated to be consumed under the No Project Alternative.

The No Project Alternative is expected to accommodate the same increase in total population as the Plan. The Plan includes additional transportation improvements that facilitate access to agricultural lands, vacant lands, open space, and recreational lands that could be less accessible with the No Project Alternative. This improved accessibility under the Plan and could help facilitate population and economic growth in areas of the region that are currently not developed. However, the Plan also includes land use measures that would help reduce the consumption and disturbance of agricultural lands, vacant lands, open space, and recreation lands. These policies would not be adopted under the No Project Alternative (although individual jurisdictions are likely to adopt some of the growth strategies independently of the 2012-2035 RTP/SCS). **It is anticipated that because of the increased consumption of land under the No Project Alternative, it would have greater impacts as compared to impacts under the Plan.**

It is anticipated that the No Project Alternative would have less impact on existing urban parks and recreational facilities because of fewer transportation projects and a more dispersed growth pattern.

Cumulative

Both the plan and No Project Alternative would contribute to loss of recreational lands in California. The No Project Alternative would result in considerably more urbanization and loss or regional open space and would therefore have a much greater impact on cumulative loss of such land.

SOLID WASTE DISPOSAL AND TRANSFER FACILITIES

REGULATORY FRAMEWORK

Federal

Federal Agencies and Regulations. 40 CFR, Part 258 Subtitle D of the Resource Conservation and Recovery Act (RCRA) establishes minimum location standards for siting municipal solid waste landfills. Because California laws and regulations governing the approval of solid waste landfills meet the requirements of Subtitle D, the USEPA delegated the enforcement responsibility to the State of California. California laws and regulations governing these facilities are summarized below.

State

California Integrated Waste Management Act. As many of the landfills in the state are approaching capacity and the siting of new landfills becomes increasingly difficult, the need for source reduction, recycling, and composting has become readily apparent. In response to this increasing solid waste problem, in September 1989 the state Assembly passed Assembly Bill (AB) 939, known as the California Integrated Waste Management Act. The Act requires every City and County in the state to prepare a Source Reduction and Recycling Element (SRRE) with its Solid Waste Management Plan that identifies how each jurisdiction will meet the mandatory state waste diversion goals of 25 percent by the year 1995 and 50 percent by the year 2000. Senate Bill 2202 mandates that jurisdictions continue 50 percent diversion on and after January 1, 2000. The purpose of AB 939 is to facilitate the reduction, recycling, and re-use of solid waste to the greatest extent possible. Noncompliance with the goals and timelines set forth within AB 939 can be severe, since the bill imposes fines of up to $10,000 per day on cities and counties not meeting these recycling and planning goals.[6]

California Integrated Waste Management Board (CIWMB). The CIWMB has numerous responsibilities in implementing the federal and state regulations summarized above. The CIWMB is the state agency responsible for permitting, enforcing and monitoring solid waste landfills, transfer stations, material recovery facilities (MRFs), and composting facilities within California. Permitted facilities are issued Solid Waste Facility Permits (SWFPs) by the CIWMB. The CIWMB also certifies and appoints Local Enforcement Agencies (LEAs), county or city agencies which monitor and enforce compliance with the provisions of SWFPs. The CIWMB is also responsible for monitoring implementation of AB 939 by the cities and counties. In addition to these responsibilities, CIWMB also manages the Recycled-Content Materials Marketing Program to increase the understanding of and commitment to using specific recycled-content products in road applications, public works projects and landscaping. These products include recycled aggregate, tire-derived aggregate (TDA), rubberized asphalt concrete (RAC), and organic materials.

As discussed above AB 939 requires that each County in the state of California prepare a Countywide Integrated Waste Management Plan (CIWMP). The CIWMP is a countywide planning document that describes the programs to be implemented in unincorporated and incorporated areas of the county that will effectively manage solid waste, and promote and implement the hierarchy of the CIWMB. The CIWMPs consists of a Summary Plan (SP), a Source Reduction and Recycling Element (SRRE), a Household Hazardous Waste Element (HHWE), a Non-Disposal Facility Element (NDFE), and a Countywide Siting Element (CSE).[7]

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[6]CIWMB, "California Waste Stream Profiles: Jurisdictions," Retrieved December 14, 2007 from http://www.ciwmb.ca.gov/profiles/juris/.

[7]CIWMB, Countywide Integrated Waste Management Plan Enforcement, Retrieved November 8, 2007 from http://www.ciwmb.ca.gov/LgLibrary/Policy/CIWMPEnforce/Default.htm#Table

Local

Summary Plan (SP). A Summary Plan is a solid waste planning document required by Public Resources Code Section 41751, in which counties or regional agencies provide an overview of significant waste management problems faced by the jurisdiction, along with specific steps to be taken, independently and in concert with cities within their boundaries.

Source Reduction and Recycling Element (SRRE). The SRRE consists of the following components: waste characterization, source reduction, recycling, composting, solid waste facility capacity, education and public information, funding, special waste and integration. Each city and county is required to prepare, adopt, and submit to the Board an SRRE, which includes a program for management of solid waste generated within the respective local jurisdiction. The SRREs must include an implementation schedule for the proposed implementation of source reduction, recycling, and composting programs. In addition, the plan identifies the amount of landfill and transformation capacity that will be needed for solid waste which cannot be reduced, recycled, or composted.[8]

Household Hazardous Waste Element (HHWE). Each city and county is required to prepare, adopt and submit to the Board, a HHWE which identifies a program for the safe collection, recycling, treatment, and disposal of hazardous wastes that are generated by households. The HHWE specifies how household hazardous wastes generated by households within the jurisdiction must be collected, treated, and disposed. An adequate HHWE contains the following components: Evaluation of Alternatives, program selection, funding, implementation schedule and education and public information.[9]

Non-Disposal Facility Element (NDFE). Each city and county is required to prepare, adopt and submit to the Board, an NDFE which includes a description of new facilities and expansion of existing facilities, and all solid waste facility expansions (except disposal and transformation facilities) that recover for reuse at least five percent of the total volume. The NDFE are to be consistent with the implementation of a local jurisdiction's SRRE. Each jurisdiction must also describe transfer stations located within and outside of the jurisdiction, which recover less than five percent of the material received.[10]

Countywide Siting Element (CSE). Counties are required to prepare a CSE that describes areas that may be used for developing new disposal facilities. The element also provides an estimate of the total permitted disposal capacity needed for a 15-year period if counties determine that their existing disposal capacity will be exhausted within 15 years or if additional capacity is desired (PRC Sections 41700-41721.5).

Each county in the SCAG region has created a CIWMP in accordance with AB 939. Below is a brief description of the recent updates to these plans by county.

Imperial County

Imperial County's Integrated Waste Management Plan was comprehensively revised in 1998 and 1999. In 2003, the Nondisposal Facility element was amended to emphasize the development of medium and large volume transfer and processing stations at existing landfills to reduce operational costs. These facilities will be operated by the County and are expected to be located at the Brawley, Imperial, Holtville, and Picacho landfills. The Summary Plan identifies goals and policies to improve source reduction and recycling and includes specific programs to reduce the volume of tires and the amount of construction and demolition

[8]CIWMP Enforcement Part I: Plan Adequacy**.** As approved by the Board on November 17, 1993 http://www.ciwmb.ca.gov/LgLibrary/Policy/CIWMPEnforce/Part1/SRREAdq.htm , and Title 14, Chapter 9, of the California Code of Regulations (CCR): Articles 6.1, 6.2, and 7.0) Statutes: PRC sections 41000-41460.

[9]Title 14, Chapter 9, of the CCR: Article 6.3 and 7.0) Statutes: PRC Sections 41500-41510.

[10]Public Resources Code, Sections 41730-41736.

debris disposed of at county landfills. The plan will be assessed regularly and updated when necessary to reflect new goals and policies or proposed development of new facilities.

Los Angeles County

Los Angeles County is revising its Summary Plan and Siting Element to reflect changes in the County's policies and goals, including promotion of conversion technologies, formation of the Los Angeles Regional Agency, update of countywide jurisdiction assistance programs to meet diversion goals, expansion of existing disposal facilities, and development of additional non-disposal facilities for the use of out-of-county disposal facilities. Plan revisions are expected to be completed by 2012.

The County's 2009 Annual Report details the revision process, assesses remaining permitted capacity for the mandated 15-year planning horizon, and outlines seven disposal capacity scenarios, two of which project sufficient capacity to meet future demand through the use of conversion technologies and out-of-county disposal facilities. The Annual Report outlines county solid waste management challenges, including a projected shortfall of permitted disposal capacity in the county, insufficient markets for recovered materials, and steps to promote and develop conversion technologies.

Orange County

Orange County completed the first review of its CIWMP in April 2003. It found sufficient disposal capacity for the 15-year planning horizon, but identified other challenges, including the lack of an operational materials recovery facility in the southern portion of the county, changes in records management to comply with the Disposal Recovery System, and determination of accurate base year data.

In addition to the CIWMP, Orange County's Integrated Waste Management Department has initiated a long-term strategic planning project—the Regional Landfill Options for Orange County (RELOOC)—which assesses the solid waste disposal needs of Orange County for the next 40 years. RELOOC's 2007 Strategic Plan Update summarizes progress to maximize capacity at existing landfills, assess alternative technologies and potential out-of-county disposal sites, and expand the Frank R. Bowerman and Olinda Alpha landfills.

Riverside County

Riverside County's CIWMP was approved in 1996, and its 2010 Annual Report found the original plan remained applicable, so no comprehensive update is planned. The Non-disposal Facility Element was updated in 2009 and includes plans for four possible solid waste material recovery and transfer facilities; two of which would include household hazardous waste disposal facilities. The Element also includes an additional proposed solid waste material recovery facility with capacity for household hazardous waste disposal and one composting facility. The 2008 Five Year Review Report for the CIWMP concluded that the most effective allocation of available resources is to continue to utilize the existing CIWMP as a planning tool augmented by annual reports, and that a revision of the CIWMP is not warranted.

San Bernardino County

San Bernardino County CIWMP five-year review report was completed in 2007. The report reflects updates to the county's goals and policies, changes to its disposal facilities, and assesses disposal capacity for the mandated 15-year planning horizon. Updated policies include programs to help jurisdictions reach diversion goals, such as additional recycling and composting programs and the development of regional material recovery facilities. The 2007 review found that based on the remaining permitted refuse capacity and projected refuse generation for disposal, the landfills within the county have approximately 26 years of capacity.

Ventura County

Ventura County's CIWMP was approved in 1995 and 1996 and updated in 2000. In 2000, the county developed two disposal capacity scenarios for the 15-year time horizon: one involved expansion of the Simi Valley Landfill; the other planned for closure of the landfill and the resulting capacity shortfall. Expansion was approved in 2003, providing sufficient disposal capacity. The county submitted its most recent Five-Year Annual Review report in November 2010, which addressed future needs, plans, and policies. The report determined that there is at least 15 years of disposal capacity for Ventura County waste.

Regional Water Quality Control Boards (RWQCB). New or expanded landfills must submit Reports of Waste Discharge to RWQCBs prior to landfill operations. In conjunction with the CIWMB approval of SWFPs, RWQCBs issue Waste Discharge Orders which regulate the liner, leachate control and removal, and groundwater monitoring systems at Class III landfills.

South Coast Air Quality Management District (SCAQMD). The SCAQMD regulates emissions from landfills. Landfill owners/operators must obtain permits to construct and operate landfill flares, cogeneration facilities or other facilities used to combust landfill gas. Owner/operators also are subject to the provisions of SCAQMD Rule 1150.1 (Control of Gaseous Emissions from Landfills). This rule requires the submittal of a compliance plan for implementation of a landfill gas control system, periodic ambient monitoring of surface emissions, and the installation of probes to detect the lateral migration of landfill gas.

EXISTING SETTING

Solid Waste Disposal and Transfer Facilities

Over the past thirteen years, disposal tonnage has decreased significantly in the SCAG region as the emphasis on recycling to meet the requirements of AB 939 has served to divert tonnage from landfills and conserve landfill capacity. **Table 3.11-7** shows data from the California Integrated Waste Management Board (CIWMB) regarding the number of tons disposed in 2010 (the most recent year for which information is available), for each county in the SCAG region.

TABLE 3.11-7: SOLID WASTE DISPOSED OF IN THE SCAG REGION - CY 2010

County	Total Tonnage
Imperial	224,740
Los Angeles	6,516,797
Orange	3,522,125
Riverside	3,089,583
San Bernardino	1,251,968
Ventura	878,468
SCAG Region	15,483,681
California	30,155,572

SOURCE: CIWMB Landfill Tonnage Reports, http://www.ciwmb.ca.gov/Landfills/Tonnages/, accessed August 11, 2011.

In viewing facilities on a county-by-county basis, it is important to note that landfills in one county may import waste generated elsewhere. Currently, Orange County offers capacity to out-of-county waste at a "tipping fee" low enough to attract waste from Los Angeles and San Bernardino Counties. In Riverside County, the El Sobrante Landfill is licensed to accept up to 10,000 tons of waste per day from Riverside, Los Angeles, Orange, San Diego, and San Bernardino counties. In Ventura County, 25 percent of the waste accepted by the Simi Valley Landfill & Recycling Center comes from other counties. **Map 3.11-2**, located in Chapter 8.0, illustrates the location of landfills in the region and **Table 3.11-8** provides detailed information on permitted active solid waste landfills in the SCAG region.

TABLE 3.11-8: PERMITTED ACTIVE SOLID WASTE LANDFILLS IN THE SCAG REGION

Name	County	Closure Date	Maximum Daily Disposal (tons/day)	Maximum Capacity/a/ (cu yds)	Remaining Capacity/a/ (cu yds)
Allied Imperial Landfill	Imperial	3/1/2012	1,135	4,324,200	1,901,305
Calexico Solid Waste Site	Imperial	7/31/2071	150	2,064,598	1,117,639
Hot Spa Solid Waste Site	Imperial	4/1/2036	10	516,266	57,497
Imperial Solid Waste Site	Imperial	9/1/2015	207	1,936,000	183,871
Monofill Facility	Imperial	1/31/2025	750	1,729,800	1,058,252
Niland Solid Waste Site	Imperial	6/1/2040	55	131,000	44,053
Salton City Solid Waste Site	Imperial	12/31/2017	50	2,581,300	346,700
Antelope Valley Public Landfill	Los Angeles	9/1/2022	1,400	6,480,000	2,978,143
Burbank Landfill Site No. 3	Los Angeles	1/1/2053	240	5,933,365	5,107,465
Calabasas Sanitary Landfill	Los Angeles	9/30/2025	3,500	69,300,000	18,100,000
Chitquita Canyon Sanitary Landfill	Los Angeles	11/24/2019	6,000	63,900,000	29,300,000
Lancaster Landfill and Recycling Center	Los Angeles	8/2/2012	17,000	26,665,000	19,088,739
Pebbly Beach (Avalon) Disposal Site	Los Angeles	1/1/2020	49	143,142	104,100
Puente Hills Landfill	Los Angeles	10/31/2013	13,200	74,000,000	35,200,000
San Clemente Island Landfill	Los Angeles	1/1/2032	10	235,459	209,816
Savage Canyon Landfill	Los Angeles	12/31/2048	350	14,947,962	9,519,240
Scholl Canyon Sanitary Landfill	Los Angeles	12/31/2024	3,400	58,900,000	12,100,000
Sunshine Canyon City Landfill Unit 2	Los Angeles	12/31/2037	12,100	140,900,000	112,300,000
Frank R. Bowerman Sanitary LF	Orange	13/31/2022	8,500	127,000,000	59,411,872
Olinda Alpha Sanitary Landfill	Orange	12/31/2021	8,000	74,900,000	38,578,383
Prima Deshecha Sanitary Landfill	Orange	12/31/2067	4,000	172,900,000	87,384,799
Badlands Sanitary Landfill	Riverside	1/1/2024	4,000	33,560,993	14,730,025
Blythe Sanitary Landfill	Riverside	6/1/2047	400	6,034,148	4,159,388
El Sobrante Landfill	Riverside	1/1/2045	16,054	184,930,000	145,530,000
Lamb Canyon Sanitary Landfill	Riverside	4/30/2021	3,000	34,292,000	18,955,000
Oasis Sanitary Landfill	Riverside	10/31/2086	400	494,822	149,597
Barstow Sanitary Landfill	San Bernardino	5/1/2071	1,500	8,354,500	924,401
California Street Landfill	San Bernardino	1/1/2042	829	10,000,000	6,800,000
Colton Sanitary Landfill	San Bernardino	1/1/2017	3100	15,497,000	2,700,000
Fort Irwin Sanitary Landfill	San Bernardino	1/1/2045	100	19,000,000	18,935,202
Landers Sanitary Landfill	San Bernardino	1/1/2013	1,200	3,080,000	765,098
Mid-Valley Sanitary Landfill	San Bernardino	4/1/2033	7,500	101,300,000	67,520,000
Mitsubishi Cement Plant Cushenbury Landfill	San Bernardino	1/1/2034	40	520,400	221,600
San Timoteo Sanitary Landfill	San Bernardino	5/1/2016	1,000	20,400,000	11,360,000
USMC - 29 Palms Disposal Facility	San Bernardino	1/1/2076	100	10,945,000	10,821,000
Victorville Sanitary Landfill	San Bernardino	10/1/2047	3,000	83,200,000	81,510,000
Simi Valley Landfill & Recycling Center	Ventura	1/31/2027	3,000	43,500,000	20,575,377
Toland Road Landfill	Ventura	5/3/2027	1,500	30,000,000	21,983,000
		Total	**126,829**	**1,454,596,955**	**861,731,562**

/a/ Values for Maximum Capacity and Remaining Capacity are what are shown on web site. They may have been transposed.
SOURCE: CIWMB, *Solid Waste Information System,* http://www.calrecycle.ca.gov/SWFacilities/Directory/search.aspx, accessed August 11, 2011

Waste Diversion and Recycling

Since the enactment of AB 939 in 1989, local governments have implemented recycling programs on a widespread basis, making efforts to meet the 25 percent and 50 percent diversion mandates of AB 939. Statewide, the CWIMB reports that diversion increased from 10 percent in 1989 to 42 percent in 2000 and to 48 percent in 2002. As of 2008, the six counties in the SCAG region had met their disposal target rates for waste diversion.

THRESHOLDS OF SIGNIFICANCE

Based on CEQA Appendix G and as appropriate for the 2012-2035 RTP/SCS, the Plan would have a significant impact related to solid waste disposal and transfer facilities if it would:

- Generate a substantial increase in the amount of solid waste that exceeds the region's available landfills' capacity to handle and dispose of the waste.

Methodology

This following summarizes the methodology used to evaluate the expected impacts of implementation of the Plan on existing solid waste disposal and transfer facilities and associated environmental effects.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of solid waste disposal and transfer facilities includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan were adopted. This evaluation is not included in the determination of the significance of impacts (which is based on a comparison to existing conditions); however, it provides a meaningful perspective on the effects of the 2012-2035 RTP/SCS.

Determination of Significance

The following analysis evaluates solid waste disposal and transfer facilities that could be affected by the implementation of the projects, programs, and policies identified in the Plan. Impacts to these facilities were evaluated with SCAG data related to projected population, housing, and employment growth and available data on public services within the six-county region. The methodology for determining the significance of these impacts applies the significance criteria above to the expected future (2035) demand for solid waste disposal and compares future demand with the Plan to the existing capacity. Implementation of the 2012-

2035 RTP/SCS will affect solid waste facilities. Expected significant cumulative impacts include a considerable increase in demand for solid waste disposal facilities throughout the SCAG region.

Both short-term construction related impacts and long-term or permanent impacts from new facilities potentially would result from implementation of the Plan. Below are descriptions of the types of direct impacts foreseeable from new transportation projects proposed in the 2012-2035 RTP/SCS. Indirect, cumulative impacts from implementation of the Plan, in combination with increases in growth and development, are also identified. It should be noted, however, that project specific impacts may vary and appropriate mitigation measures would need to be developed on a project-by-project basis.

IMPACTS

Impact 3.11-8: Construction necessary to implement the 2012-2035 RTP/SCS would affect the demand for solid waste services in the SCAG region.

Many of the projects within the 2012-2035 RTP/SCS have the potential to generate a substantial amount of solid waste during construction, such as new transit lines, truck lanes, HOV connectors, and HST projects through grading and excavation activities as well as debris resulting from removal of structures. Construction of urban development would be expected to generate similar debris. Construction debris could be recycled or used as fill at other projects (clean dirt) or transported to the nearest landfill site and disposed of appropriately. Currently, several landfills in the SCAG region function at or below their permitted capacity (Table 3.11-8). The projects proposed under the 2012-2035 RTP/SCS are not anticipated to generate a significant amount of solid waste during construction such that local landfills would be significantly impacted. Nevertheless, the amount of debris generated during project construction would need to be evaluated prior to construction on a project-by-project basis. Increasing urban development would be expected to generate substantial solid waste. However, with increasingly stringent requirements to reduce, and recycle wastes impacts would be a lot less than have occurred as a result of growth in previous years. The mitigation measures described below would help to further reduce impacts.

Some transportation facilities could generate incremental amounts of waste (transit facilities – stations and debris collected from other facilities, also roadside waste).

Although the SCAG region has existing capacity for solid waste and has several landfills that are scheduled to be open through the life of the plan, as shown previously in Table 3.11-8, there may be insufficient waste disposal capacity where the waste is being generated. As a result, solid waste may need to be shipped by truck or rail from urbanized areas to the remote disposal locations in Riverside and Imperial Counties.

The 2012-2035 RTP/SCS includes all transportation and development in the region through 2035. Population of the SCAG region is forecast to increase by approximately 3.9 million people by 2035. The California Department of Resources Recycling and Recovery (CalRecycle) estimates that the average resident in California disposes of 4.5 pounds of trash per day.[11] Considering an average diversion rate of 50 percent, this equates to approximately 2.3 pounds of trash per day.[12] Assuming a similar generation rate, residents in Los Angeles County would generate approximately 26 million pounds of waste per day in 2035. Residents in the remaining counties in the SCAG region would generate approximately 25 million pounds of waste per day in 2035 for a regional total of approximately 51 million pounds per day, requiring landfilling.[13]

[11] CalRecycle, *California's Statewide Per Resident, Per Employee, and Total Disposal Since 1989*, available at: http://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/disposal.htm, accessed December 2011.

[12] Assuming all jurisdictions meet the AB 939 diversion rate of 50 percent.

[13] CalRecycle, *California's Statewide Per Resident, Per Employee, and Total Disposal Since 1989*, available at: http://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/disposal.htm, accessed December 2011.

Non-residential land uses also generate waste, and generally at a higher rate than residential uses. Based on data from CalRecycle, the average California employee generates 5.8 pounds of trash, assuming a 50 percent diversion rate. According to this data, the estimated 9.44 million employees within the SCAG region in 2035 would generate approximately 54.7 million pounds of waste per day, requiring landfilling.[14]

The SCAG region has existing capacity for solid waste (Table 3.11-8) and has several landfills that are scheduled to be open through the life of the plan. There is anticipated to be sufficient capacity for waste disposal in the region through 2035. However, as discussed above, there may be insufficient waste disposal capacity in the areas where the waste is being generated, in particular in the urbanized parts of the region. As a result, waste may need to be shipped by truck or rail from urbanized areas to the remote disposal locations in Riverside and Imperial Counties, where capacity exists.

Transporting 105.7 million pounds of waste per day to appropriate disposal areas would result in significant truck and rail trips and associated emissions. Implementation of Mitigation Measures **MM-PS35** through **MM-PS47** would reduce impacts to solid waste impacts, but impacts could still be significant because of the large volume of wastes and the need to move waste to landfills located at some distance from where the waste is generated.

Cumulative Impact 3.11-9: Potential to result in a cumulatively considerable demand on solid waste facilities that exceeds regional capacity.

The 2012-2035 RTP/SCS includes transportation projects and development in the region. The Plan targets growth and development in urbanized areas, in particular in HQTAs. While all of these areas are currently served by landfills, many landfills in the urbanized portions of the region are at or near capacity, resulting in a need to transport waste to less urban areas of the region, or outside the region. The transport of solid waste generated in the SCAG region possibly to areas outside the SCAG region would result in a cumulatively considerable impact to waste facilities in California. Implementation of Mitigation Measures **MM-PS48** through **MM-PS56** would reduce cumulative solid waste services impacts; however, impacts would remain significant.

MITIGATION MEASURES

Mitigation Measures **MM-PS35** through **MM-PS56** can and should be implemented by project sponsors (for both development and transportation projects) as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site- specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions.

MM-PS35: Project sponsors for projects identified in the 2012-2035 RTP/SCS can and should comply with applicable regulations related to solid waste disposal.

MM-PS36: Projects sponsors can and should work with the respective local jurisdiction's Recycling Coordinator to ensure that source reduction techniques and recycling measures are incorporated into project construction.

MM-PS37: The amount of solid waste generated during construction will be estimated prior to construction, and appropriate disposal sites will be identified and utilized.

[14] *Ibid*.

MM-PS36: Project sponsors can and should integrate green building measures into project design such as those identified in the U.S. Green Building Council's Leadership in Energy and Environmental Design, energy Star Homes, Green Point Rated Homes, and the California Green Builder Program. These measures could include the following:

- Reuse and minimization of construction and demolition (C&D) debris and diversion of C&D waste from landfills to recycling facilities.
- The inclusion of a waste management plan that promotes maximum C&D diversion.
- Source reduction through (1) use of materials that are more durable and easier to repair and maintain, (2) design to generate less scrap material through dimensional planning, (3) increased recycled content, (4) use of reclaimed materials, and (5) use of structural materials in a dual role as finish material (e.g. stained concrete flooring, unfinished ceilings, etc.).
- Reuse of existing structure and shell in renovation projects.
- Design for deconstruction without compromising safety.
- Design for flexibility through the use of moveable walls, raised floors, modular furniture, moveable task lighting and other reusable building components.
- Development of indoor recycling program and space.

MM-PS37: Local jurisdictions and waste management agencies can and should discourage the siting of new landfills unless all other waste reduction and prevention actions have been fully explored. If landfill siting or expansion is necessary, landfills can and should be sited with an adequate landfill-owned, undeveloped land buffer to minimize the potential adverse impacts of the landfill in neighboring communities.

MM-PS38: Project sponsors can and should discourage exporting of locally generated waste outside of the SCAG region during the construction and implementation of a project. Disposal within the county where the waste originates can and should be encouraged as much as possible. Green technologies for long-distance transport of waste (e.g., clean engines and clean locomotives or electric rail for waste-by-rail disposal systems) and consistency with SCAQMD and 2012-2035 RTP/SCS policies can and should be required.

MM-PS39: Project sponsors can and should encourage waste reduction goals and practices and look for opportunities for voluntary actions to exceed the 50 percent waste diversion target.

MM-PS40: Project sponsors and local jurisdictions can and should encourage the development of local markets for waste prevention, reduction, and recycling practices by supporting recycled content and green procurement policies, as well as other waste prevention, reduction and recycling practices.

MM-PS41: Local jurisdictions can and should develop ordinances that promote waste prevention and recycling activities such as: requiring waste prevention and recycling efforts at all large events and venues; implementing recycled content procurement programs; and developing opportunities to divert food waste away from landfills and toward food banks and composting facilities.

MM-PS42: Local jurisdictions and waste management agencies can and should develop alternative waste management strategies such as composting, recycling, and conversion technologies.

MM-PS43: Project sponsors, local jurisdictions and waste management agencies, where practical and feasible, can and should develop and site composting, recycling, and conversion technology facilities that have minimum environmental and health impacts.

MM-PS44: Local jurisdictions can and should require the reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).

MM-PS45: Project sponsors can and should integrate reuse and recycling into residential industrial, institutional and commercial projects.

MM-PS46: Local jurisdictions can and should provide easy and convenient recycling opportunities for residents, the public, and tenant businesses.

MM-PS47: Local jurisdictions can and should provide education and publicity about reducing waste and available recycling services.

MM-PS48: The California Integrated Waste Management Board can and should continue to enforce solid waste diversion mandates that are enacted by the Legislature.

MM-PS49: Local jurisdictions can and should continue to adopt programs to comply with state solid waste diversion rate mandates and, where possible, can and should encourage further recycling to exceed these rates.

MM-PS50: Local jurisdictions can and should implement or expand city or county-wide recycling and composting programs for residents and businesses. This could include extending the types of recycling services offered (e.g., to include food and green waste recycling) and providing public education and publicity about recycling services.

MM-PS51: Local jurisdictions, waste management agencies and SCAG can and should coordinate regional approaches and strategic siting of waste management facilities.

MM-PS52: Local jurisdictions and waste management agencies can and should encourage and, where practical and feasible, facilitate the creation of synergistic linkages between community businesses and the development of eco-industrial parks and materials exchange centers where one entity's waste stream becomes another entity's raw material.

MM-PS53: Local jurisdictions and waste management agencies can and should prioritize siting of new solid waste management facilities including recycling, composting, and conversion technology facilities in conjunction with existing waste management or material recovery facilities.

MM-PS54: Local jurisdictions and waste management agencies can and should increase programs to educate the public and increase awareness of reuse, recycling, composting, and green building benefits and raise consumer education issues at the county and city level, as well as at local school districts and education facilities.

MM-PS55: For projects identified in the 2012-2035 RTP/SCS that require solid waste collection, project sponsors will coordinate with the local public works department to ensure that the existing public services and utilities would be able to handle the increase. If the current infrastructure servicing the project site is found to be inadequate, infrastructure improvements for the appropriate public service or utility can and should be identified in each project's CEQA documentation.

MM-PS56: The growth inducing potential of individual projects can and should be carefully evaluated so that the full implications of the projects are understood. Individual environmental documents should quantify indirect impacts (growth that could be facilitated or induced) on public services and utilities to the extent feasible. Lead and responsible agencies then will

make any necessary adjustments to the applicable General Plan. Any such identified adjustment should be communicated to SCAG.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Demand for Solid Waste Services

Impacts related to the potential to the demand for solid waste services in the SCAG region were determined to be significant without mitigation. Implementation of Mitigation Measures **MM-PS35** through **MM-PS56** would reduce the impacts, but impacts would remain potentially significant because of the need to move solid waste large distances, potentially out of the region.

COMPARISION WITH THE NO PROJECT ALTERNATIVE

Under the No Project Alternative, the population of the SCAG region will grow by 3.9 million people, however, no regional transportation investments would be made above the existing programmed projects. The population distribution could follow past trends, uninfluenced by additional transportation investments.

Direct Impacts

The No Project Alternative contains fewer transportation projects than the Plan. With fewer transportation projects being constructed, the need for solid waste disposal facilities for construction related debris would be less under the No Project Alternative than under the Plan. However, the Plan's growth-related impacts would remain the same as the Plan and the No Project Alternative would result in the same regional population totals. The No Project Alternative would have a more dispersed growth pattern which is generally less efficient and could results in more waste (more green waste for example from more landscaping of the increased amount of urban land). **Plan impacts and No Project impacts could be similar in the total amount of waste generated.**

Cumulative Impacts

The No project Alternative would result in a less efficient growth pattern that could result in the generation of more solid waste than the Plan. **As with the Plan potential remains to move solid waste large distances, potentially out of the region resulting in a cumulative impact to solid waste facilities in California.**

ENERGY

Energy and greenhouse gas emissions are closely linked, so this subsection should be read together with section 3.6 Greenhouse Gas Emissions. Energy consumption is a large source of greenhouse gas emissions (GHGs) and regulations to address energy also address GHGs, therefore there is some overlap in the discussions in this subsection and Section 3.6.

REGULATORY FRAMEWORK

Public Utility Regulatory Policies Act of 1978 (PURPA) (Public Law 95-617). PURPA was passed in response to the unstable energy climate of the late 1970s. PURPA sought to promote conservation of electric energy. Additionally, PURPA created a new class of nonutility generators, small power producers, from which, along with qualified cogenerators, utilities are required to buy power.

PURPA was in part intended to augment electric utility generation with more efficiently produced electricity and to provide equitable rates to electric consumers. Utility companies are required to buy all electricity from "Qfs" (qualifying facilities) at avoided cost (avoided costs are the incremental savings associated with not having to produce additional units of electricity). PURPA expanded participation of nonutility generators in the electricity market, and demonstrated that electricity from nonutility generators could successfully be integrated with a utility's own supply. PURPA requires utilities to buy whatever power is produced by Qfs (usually cogeneration or renewable energy). Utilities want these provisions repealed, critics argue that it will decrease competition and impede development of the renewable energy industry. The Fuel Use Act (FUA) of 1978 (repealed in 1987) also helped Qfs become established. Under FUA, utilities were not allowed to use natural gas to fuel new generating technologies but Qfs which were by definition not utilities, were able to take advantage of abundant natural gas and abundant new technologies (such as combined-cycle). The technologies lowered the financial threshold for entrance into the electricity generation business as well as shortened the lead time for constructing new plants.

Energy Policy Act of 2005. On August 8, 2005, President George W. Bush signed the National Energy Policy Act of 2005 into law. This comprehensive energy legislation contains several electricity-related provisions that aim to:

- Help ensure that consumers receive electricity over a dependable, modern infrastructure;
- Remove outdated obstacles to investment in electricity transmission lines;
- Make electric reliability standards mandatory instead of optional; and
- Give Federal officials the authority to site new power lines in DOE-designated national corridors in certain limited circumstances.

Clean Air Act. Section 211(o) of the Clean Air Act (the Act), as amended by the Energy Policy Act of 2005, requires the Administrator of the Environmental Protection Agency (EPA) to annually determine a renewable fuel standard (RFS) which is applicable to refiners, importers and certain blenders of gasoline, and publish the standard in the Federal Register by November 30 of each year. On the basis of this standard, each obligated party determines the volume of renewable fuel that it must ensure is consumed as motor vehicle fuel. This standard is calculated as a percentage, by dividing the amount of renewable fuel that the Act requires to be blended into gasoline for a given year by the amount of gasoline expected to be used during

that year, including certain adjustments specified by the Act. The notice, published in November of 2011, included an RFS of 8.01 percent for 2011.[15]

State

The California Energy Commission and California Public Utilities Commission have jurisdiction over the investor-owned utilities (IOUs) in California. The California Energy Commission also collects information for the Los Angeles Department of Water and Power (LADWP) and the Burbank, Glendale and Pasadena Municipal Utilities.

California Building Energy Efficiency Standards: Title 24. California established statewide building energy standards following legislative action. The legislation required the standards to:

- Be cost effective;
- Be based on the building life cycle; and
- Include both prescriptive and performance-based approaches.

California's building efficiency standards (along with those of energy efficient appliances) have saved more than $56 billion in electricity and natural gas costs since 1978. It is estimated the standards will save an additional $23 billion by 2013.[16]

The standards have been periodically updated as technology and design have evolved. Generally, the standards are updated every three years. As a result of AB 970, passed in the fall of 2000 in response to the state's electricity crisis, an emergency update of the Standards went into effect in June 2001. The Commission then initiated an immediate follow-on proceeding to consider and adopt updated Standards that could not be completed during the emergency proceeding. The 2005 Building Energy Efficiency Standards were adopted in November 2003, took effect October 1, 2005. The Energy Commission has begun development of the 2012 update to the Building Energy Efficiency Standards.

Title 24 of the California Code of Regulations comprises the state Building Standards Code. Part 6 of Title 24 is the California Energy Code, which includes the building energy efficiency standards. The standards include provisions applicable to all buildings, residential and non-residential, which describe requirements for documentation and certificates that the building meets the standards. These provisions include mandatory requirements for efficiency and design of the following types of systems, equipment, and appliances:

- Air conditioning systems
- Heat pumps
- Water chillers
- Gas- and oil-fired boilers
- Cooling equipment
- Water heaters and equipment
- Pool and spa heaters and equipment
- Gas-fired equipment including furnaces and stoves/ovens
- Windows and exterior doors
- Joints and other building structure openings ("envelope")
- Insulation and cool roofs
- Lighting control devices.

The standards include additional mandatory requirements for space conditioning (cooling and heating), water heating and indoor and outdoor lighting systems and equipment in non-residential, high-rise residential, and hotel or motel buildings.

[15]USEPA, Office of Transportation and Air Quality, *EPA Finalizes 2011 Renewable Fuel Standards*, available at http://www.epa.gov/oms/fuels/renewablefuels/420f10056.pdf, accessed August 16, 2011.

[16]California Code of Regulations. Title 24, Part 6.

Mandatory requirements for low-rise residential buildings cover indoor and outdoor lighting, fireplaces, space cooling and heating equipment (including ducts and fans), and insulation of the structure, foundation, and water piping.

In addition to the mandatory requirements, the Standards call for further energy efficiency that can be provided through a choice between performance and prescriptive compliance approaches. (Separate sections apply to low-rise residential and to non-residential, high-rise residential, and hotel or motel buildings.) In buildings designed for mixed use (e.g., commercial and residential), each section must meet the standards applicable to that type of occupancy.[17]

The performance approach provides for the calculation of an energy budget for each building and allows flexibility in building systems and features to meet the budget. The energy budget addresses space-conditioning (cooling and heating), lighting, and water heating. Compliance with the budget is determined by the use of a CEC-approved computer software energy model. The alternative prescriptive standards require demonstrating compliance with specific minimum efficiency for components of the building such as building envelope insulation R-values, fenestration (areas, U-factor and solar heat gain coefficients of windows and doors) and heating and cooling, water heating and lighting system design requirements. These requirements vary depending on the building's location in the state's 16 climate zones.

The 2005 standards that became effective statewide October 1, 2005, include the following major changes:

- Updated energy budgets that recognize the time dependence of energy usage by season and time of day
- Incorporation of new federal appliance standards and other advances in technology emerging from the state's Public Interest Energy Research program
- Incorporation of new state standards for outdoor lighting and for indoor and outdoor signs
- Changes to improve the quality of construction and verification of reliable energy savings

Executive Order S-3-05. On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05, which establishes greenhouse gas (GHG) emission reduction targets for California, and directs the California Environmental Protection Agency Secretary to coordinate the oversight of efforts to achieve them.

The targets established by Governor Schwarzenegger call for a reduction of GHG emissions to 2000 levels by 2010; a reduction of GHG emissions to 1990 levels by 2020; and a reduction of GHG emissions to 80 percent below 1990 levels by 2050.

AB 32: Global Warming Solutions Act. Governor Arnold Schwarzenegger signed AB 32 (Global Warming Solutions Act) into law on September 27, 2006, requiring that the California Air Resources Board (ARB) reduce GHG emissions by 25 percent by 2020. In the interim, ARB will begin to measure the GHG emissions of the industries it determines to be significant emitters. The bill also provides the Governor the ability to invoke a safety valve and suspend the emissions caps for up to one year in the case of an emergency or significant economic harm.

AB 32 requires ARB to:

- Establish a statewide GHG emissions cap for 2020, based on 1990 emissions by January 1, 2008;
- Adopt mandatory reporting rules for significant sources of GHG by January 1, 2008;

[17]California Energy Commission, 2005 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, P400-03-001F, Effective Date October 1, 2005, Section 100(f).

- Adopt a plan by January 1, 2009 indicating how emission reductions will be achieved from significant GHG sources; and
- Adopt a list of early actions by July 1, 2007 that can be implemented before January 1, 2010.

Executive Order S-20-06. This Executive Order directs ARB to collaborate with the Secretary for Environmental Protection and the Climate Action Team to develop a comprehensive market-based compliance program with the goal of creating a program that permits trading with the European Union, the Regional Greenhouse Gas Initiative and other jurisdictions. ARB shall consider the recommendations of the Market Advisory Committee in the development of the market-based compliance program

AB 1007, Alternative Fuels Plan. Assembly Bill (AB) 1007, (Pavley, Chapter 371, Statutes of 2005) requires the California Energy Commission (Energy Commission) to prepare a state plan to increase the use of alternative fuels in California (Alternative Fuels Plan). The Energy Commission must prepare the plan in partnership with the California Air Resources Board, and in consultation with the other state, federal and local agencies. In preparing the Alternative Fuels Plan, the Committee will incorporate and build on the work currently underway within the Bio-Energy Interagency Working Group, the work of other agencies, and also will examine the broader suite of alternative fuels that could benefit California's transportation market.

The State Alternative Fuels Plan approved by the Energy Commission on November 2, 2007 was mandated by AB 1007 (Pavley) aimed at cleaning the state's air, diversifying fuel sources and protecting the state from oil spikes that affect prices, the economy and jobs. The plan supports Governor Arnold Schwarzenegger's goal of reducing statewide greenhouse gases to 80 percent below 1990 levels by 2050.

To achieve this objective, the Alternative Fuels Plan, recommends that the Governor set targets on a gasoline gallon equivalent basis for use of 10 different alternative motor fuels in the on-road and off-road sectors by nine percent by 2012, 11 percent by 2017 and 26 percent by 2022. These targets do not apply to air, rail or marine fuel uses. These goals will require a dramatic expansion in the use of such fuels as electricity, compressed natural gas, hydrogen, renewable diesel, bio-diesel and ethanol in motor vehicles.

Also built into the Alternative Fuels Plan is a multi-part strategy to develop hybrid and electric vehicle technologies; build the infrastructure to deliver the alternative fuels; increase the blending of more biofuels into gasoline and diesel; improve the fuel efficiency of vehicles; and reduce miles traveled by California motorists with more effective land use planning.

Low Carbon Fuel Standard. On January 9 2007, Governor Schwarzenegger signed Executive Order S-01-07 to establish a Low Carbon Fuel Standard (LCFS) for transportation fuels sold in California. By 2020, the standard will reduce the carbon intensity of California's passenger vehicle fuels by at least ten percent. The LCFS will support AB 32 emissions targets as part of California's overall strategy to fight global warming.

AB 1493, Vehicle Climate Change Standards. AB 1493 required the State to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light-duty trucks. Regulations were adopted by ARB in September 2004.

SB 1368, Greenhouse Gas Emissions Performance Standard for Major Power Plant Investments. This law requires the California Energy Commission to develop and adopt by regulation a greenhouse gas emissions performance standard for long-term procurement of electricity by local publicly owned utilities. The California Energy Commission must adopt the standard on or before June 30, 2007 and must be consistent with the standard adopted by the CPUC for load-serving entities under their jurisdiction on or before February 1, 2007.

SB 107, Renewable Energy Procurement. This law, written by Senator Joseph Simitian (D-Palo Alto) requires investor owned utilities such as Pacific Gas and Electric, SCE and San Diego Gas and Electric, to

have 20 percent of its electricity come from renewable sources by 2010. Previously, state law required that this target be achieved by 2017.

California Solar Initiative. On January 12, 2006, the CPUC approved the California Solar Initiative (R.04-03-017), which provides $2.9 billion in incentives between 2007 and 2017. The CPUC will oversee a $2.5 billion program for commercial and existing residential customers, funded through revenues and collected from gas and electric utility distribution rates. Furthermore, the California Energy Commission (CEC) will manage $350 million targeted for new residential building construction, utilizing funds already allocated to the CEC to foster renewable projects between 2007 and 2011.

On March 2, 2006, the CPUC opened a proceeding to develop rules and procedures for the California Solar Initiative and to continue consideration of policies for the development of cost-effective, clean and reliable distributed generation (DG). On August 21, 2006, the Governor signed Senate Bill 1 (SB 1), which directs the CPUC and the Energy Commission to implement the CSI program consistent with specific requirements and budget limits set forth in the legislation and directs the CPUC and the Energy Commission to create 3,000 megawatts of new, solar-produced electricity by 2017.

The PUC has a rulemaking in progress to reconcile its decisions with SB 1, and it also continues to hold public workshops to continue designing program elements.

Current incentives provide an upfront, capacity-based payment for a new system. The CSI incentive system will change in 2007 when it moves to performance-based payments. In its August 24, 2006, decision, the CPUC shifted the program from volume-based to performance-based incentives and clarified many elements of the program's design and administration.[18]

AB 2075, Reducing Dependence on Petroleum

The CEC and ARB are directed by law (2000 AB 2075) to develop and adopt recommendations for reducing dependence on petroleum. A performance based goal is to reduce petroleum demand to 15 percent below 2003 demand. The options include:[19]

Near-Term Options (could be fully implemented by 2010)
- Use more fuel efficient replacement tires with proper inflation;
- Improve fuel economy in government fleets; and
- Improve private vehicle maintenance.

Mid-Term Options (could be fully implemented in the 2010-2020 time frame)
- Double fuel efficiency of current model light duty vehicles to 40 miles/gallon; and
- Use natural gas-derived Fischer-Tropsch fuel as a 33 percent blending agent in diesel.

Long-Term Options
- Introduce fuel cell light duty vehicles in 2012, increasing to 10 percent of new vehicle sales by 2020, and 20 percent by 2030.

[18]California Solar Initiative. Retrieved October 31, 2007 from http://www.gosolarcalifornia.ca.gov/csi/index.html.
[19]CEC/California Air Resources Board: Reducing California's Petroleum Dependence, August 14, 2003 Final, Adopted Joint Agency AB 2076 Report, publication # 600-03-006F.

Recommendations include:[20]

- The Governor and Legislature should adopt the recommended statewide goal of reducing demand for on-road gasoline and diesel to 15 percent below the 2003 demand level by 2020 and maintaining that level for the foreseeable future;
- The Governor and Legislature should work with the California delegation and other states to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks and SUVs; and
- The Governor and Legislature should establish a goal to increase the use of non-petroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030.

SB 97, CEQA Guidelines for Greenhouse Gas Emissions. SB 97 requires the Governor's Office of Planning and Research (OPR) to prepare CEQA Guidelines for the mitigation of GHG emissions, including, but not limited to, effects associated with transportation or energy consumption. OPR was required to prepare these guidelines and transmit them to the Resources Agency by July 1, 2009. The Resources Agency was required to then certify and adopt the guidelines by January 1, 2010. OPR and the Resources Agency are required to periodically review the guidelines to incorporate new information or criteria adopted by ARB pursuant to the Global Warming Solutions Act, scheduled for 2012.

Local

Clean Cities Program. The U.S. Department of Energy's (DOE) Clean Cities Program promotes voluntary, locally based government/industry partnerships for the purpose of expanding the use of alternatives to gasoline and diesel fuel by accelerating the deployment of AFVs and building a local AFV refueling infrastructure. The mission of the Clean Cities Program is to advance the nation's economic, environmental and energy security by supporting local decisions to adopt practices that contribute to the reduction of petroleum consumption. Clean Cities carries out this mission through a network of more than 80 volunteer coalitions, which develop public/private partnerships to promote alternative fuels and vehicles, fuel blends, fuel economy, hybrid vehicles, and idle reduction..

San Gabriel Valley Energy Efficiency Partnership. In April 2006, the SCAG's Regional Council authorized SCAG's Executive Director to enter into a partnership with SCE to incentivize energy efficiency programs in the San Gabriel Valley Subregion. The partnership program agreement was fully executed on October 20, 2006 and the program will run through 2008. The main goal of the San Gabriel Valley Energy Wise Program (SGVEWP) is to save a combined 3,000,000 kWh by providing technical assistance and incentive packages to cities. The program is funded by California utility customers and administered by SCE under the auspices of the CPUC.

EXISTING SETTING

Energy Types, Sources and Providers

The major sources of energy in the SCAG region include petroleum, electricity, and natural gas. Renewable resources have become a major focus of recent energy policy with increased awareness of petroleum and natural gas constraints and air quality concerns. In addition, electric power generation accounts for approximately 34 percent of emissions from all sources across the United States in 2007, and generation of

[20]CEC/California Air Resources Board: Reducing California's Petroleum Dependence, August 14, 2003 Final, Adopted Joint Agency AB 2076 Report, publication # 600-03-006F.

electricity with fossil fuels and the use of natural gas are the second largest source of greenhouse gas emissions in the state.[21]

Petroleum products represent approximately 37 percent of the energy consumption in the U.S. Natural gas and coal each supply approximately 23 percent of the national energy demand. Nuclear power represents about 8 percent of the energy consumption and renewable energy represents approximately 7 percent of energy use.[22]

Current annual consumption in the U.S. is approximately 100.58 quadrillion (10^{15}) British thermal units (Btu)[23], which represents about 22 percent of the world's energy consumption.[24]

Petroleum and natural gas supply most of the energy consumed in California. Petroleum supplies 54 percent and natural gas supplies 33 percent of California's energy.[25] In 2008, California's transportation sector consumed about 15 billion gallons of gasoline and 3 billion gallons of diesel fuel; an increase of nearly 50 percent over the last 20 years.[26] Electricity generation requires nearly half of the natural gas consumed in California.[27] Nearly all of the state's transportation system is fueled currently by fossil fuels.[28]

California consumes more energy than any other state in the U.S. except Texas. However, in terms of energy consumption per person, California ranks 47th among the 51 states, including the District of Columbia. Current annual energy consumption in California (for all purposes including transportation) is approximately 8,006 trillion Btu, which represents approximately 8.5 percent of the nation's total energy consumption.[29]

Petroleum. The United States consumes approximately 25 percent of the world's oil, while making up 5 percent of the world's population.[30] In 2009, California consumed approximately 1.8 million barrels of oil per day or 9.6 percent of the United States' oil consumption.[31] The U.S. imported approximately 49 percent of the petroleum (including crude oil and refined petroleum products) that was consumed during 2010. Approximately 49 percent of these imports were from countries in the Western Hemisphere, including North,

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[21]California Environmental Protection Agency, *Climate Action Team Report to Governor Schwarzenegger and the California Legislature*, December 2010, available at http://www.energy.ca.gov/2010publications/CAT-1000-2010-005/CAT-1000-2010-005.PDF, accessed August 22, 2011.

[22]United States Department of Energy, Energy Information Administration, *What are the major sources and user of energy in the United States?*, available at http://www.eia.gov/energy_in_brief/major_energy_sources_and_users.cfm, accessed August 16, 2011.

[23]The units of energy used in this report are British Thermal Units (Btu), kilowatt-hours (kWh), therms, and gallons. A Btu is the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at sea level. Since the other units of energy can all be converted into equivalent Btu units, the Btu is used as the basis for comparing energy consumption associated with different resources. A kWh is a unit of electrical energy, and on kWh is equivalent to approximately 10,200 Btu, taking into account initial conversion losses (i.e., from one type of energy, e.g., chemical, to another type of energy, e.g., mechanical) and transmission losses. One giga-watt hour (GWh) is equivalent to 1,000,000 kWh. Natural gas consumption typically is described in terms of cubic feet or therms; one cubic foot of natural gas is equivalent to approximately 1,050 Btu, and one therm represents 100,000 Btu. One gallon of gasoline/diesel is equivalent to approximately 140,000 Btu, taking into account energy consumed in the refining process.

[24]U.S. Energy Information Administration, International Energy Statistics, *Total Primary Energy Consumption*, available at: http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=44&pid=44&aid=2&cid=r1,&syid=2004&eyid=2008 &unit =QBTU, accessed August 16, 2011.

[25]California Energy Commission, California Energy Demand 2000-2010 Staff Report, (2000 June) page 3, Retrieved December 19, 2006 from http://www.energy.ca.gov/reports/2000-07-14_200-00-002.PDF

[26]California Energy Commission, *2010 Integrated Energy Policy Report Update*, available at: http://www.energy.ca.gov/2010publications/CEC-100-2010-001/CEC-100-2010-001-CMF.PDF, accessed August 16, 2011.

[27]California Energy Commission, Integrated Energy Policy Report, (2005, November 21) page 123.

[28]California Energy Commission, Alternative Transportation Fuels, Retrieved October 29, 2007 from http://www.energy.ca.gov/afvs/vehicle_fact_sheets/index.html

[29]United States Department of Energy, Energy Information Administration. State Energy Profiles-California, available at: http://205.254.135.24/state/state-energy-profiles-data.cfm?sid=CA#Consumption, accessed August 22, 2011.

[30]United States Department of Energy, *Oil: Crude and Petroleum Products Explained*, available at: http://www.eia.gov/energyexplained/index.cfm?page=oil_home#tab2, accessed August 22, 2011.

[31] United States Department of Energy, Energy Information Administration. State Energy Profiles-California, available at: http://205.254.135.24/state/state-energy-profiles-data.cfm?sid=CA#Consumption, accessed August 22, 2011.

South and Central America, and the Caribbean and U.S. Territories. Canada provides the largest share of imported crude oil and petroleum to the U.S. at 25 percent, followed by Saudi Arabia, Nigeria, Venezuela and Mexico. U.S. dependence on imported oil has dramatically declined since peaking in 2005. This trend is attributed to a combination of declining consumption and shifts in supply patterns as a result of the economic downturn after the financial crisis in 2008. In addition, increased use of ethanol and biodiesel, and gains in production of crude oil and natural gas have expanded domestic supplies and reduced the need for imports.[32]

California as a state ranks third in the U.S. in petroleum refining capacity and accounts for more than one-tenth of total U.S. production. California also ranks 1st in gasoline consumption and jet fuel consumption and 3rd in distillate fuel consumption.[33] California relies on oil produced within the state, Alaska, and foreign nations to supply its refineries and produce the petroleum that is used in automobiles and for other purposes. The percentage of oil that is imported from foreign nations over the past four years has ranged between 45 and 48 percent. Of the total 607 million barrels of oil refined in 2010, 38.1 percent came from in-state oil production, 14.2 percent came from Alaska and 47.6 percent came from foreign sources. Foreign sources of oil have surpassed Alaskan supplies and are reaching California supply levels.[34]

Oil is a finite and non-renewable resource and it is uncertain how future energy consumption trends will be sustained with the current political, environmental and technological constraints. Our nation's reliance on petroleum for our energy needs is even more problematic because of the global trend toward an inevitable turning point often referred to as "peak oil" the peak and then decline of global oil production. Peak oil is the point of maximum oil production whether from a single well, a country, or the planet as a whole. The maximum point of production is expected to happen when about half or slightly more of the ultimately recoverable oil has been produced. To be clear, peaking does not mean "running out." Rather, it indicates the point where global production can no longer be maintained or increased. Production will begin to decline, year after year. Geophysicist M. King Hubbert correctly predicted the 1971 peak in U.S. oil production and further predicted that sometime between 2005 and 2025, world oil production would reach a peak and begin a sharp decline.[35]

The International Energy Agency reported in July 2007 that the world will face an oil supply "crunch" within five years. This is due to faster than expected falls in supply in mature areas such as the North Sea and Mexico and new prospects in Russia are experiencing long delays. As a result, oil supply was expected to increase approximately one percent annually while demand was expected to grow at an annual rate of 2.2 percent.[36] In 2008, oil prices rose steeply, peaking in July 2008 at $147.30 per barrel; this run up in oil prices was attributed to a number of factors including reports from the U.S. Department of Energy and others showing a decline in petroleum reserves. In September 2008, the global economy took a sharp downturn; oil prices were reduced to around $40 per barrel in November 2008. Availability of oil remains uncertain and the timing of a potential crunch is unknown.

A world supply crunch will impact California and the SCAG region. A fuel shortage will take a toll on California's economy as consumers spend more of their household income on gasoline than ever before, particularly with development patterns that create long commutes without access to public transportation.

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[32]United States Department of Energy, Energy Information Administration. Petroleum, *How dependent are we on foreign oil?*, November 29, 2010, available at: http://www.eia.gov/energy_in_brief/foreign_oil_dependence.cfm, accessed August 22, 2011.

[33]United States Department of Energy, Energy Information Administration. State Energy Profiles-California, available at: http://www.eia.gov/state/state-energy-profiles-analysis.cfm?sid=CA, accessed August 22, 2011.

[34]California Energy Commission, Energy Almanac, *Monthly Receipts of Crude Oil by Source*, available at: http://energyalmanac.ca.gov/petroleum/statistics/2010_monthly_oil_sources.html, accessed August 22, 2011.

[35]Udall, R. and Andrews, S. (1999, January). When will the joy ride end? A petroleum primer. Hubbert Center Newsletter, 99(1), 1-8.

[36]International Energy Agency (July 2007). Medium Term Oil Market Report

High fuel prices also reduce profit margins for the manufacturing and industrial sectors, which pass the higher cost of their goods and services to consumers.

Natural Gas. Natural gas supply and demand data are compiled by the state's natural gas utilities in the annual California Gas Report and in the California Energy Commission's Integrated Energy Policy Report. Since 1994, California began to rely on natural gas from Canada and the Rocky Mountains region and has seen both the physical amount and the percentage produced within California as well as imported from the Southwest decrease. California imports approximately 85 percent of its natural gas supply from the Southwestern United States, the Rocky Mountains, and Canada. The remainder is produced in California.[37]

The SCAG region is served primarily by the investor-owned Southern California Gas Company (SoCalGas), a unit of Sempra Energy. SoCalGas provides natural gas service throughout the SCAG region, except for the southern portion of Orange County, and portions of San Bernardino County. San Diego Gas & Electric Company provides natural gas service to the southern portion of Orange County. In San Bernardino County, Southwest Gas Corporation provides natural gas service to Victorville, Big Bear, Barstow, and Needles. The Los Angeles Department of Water and Power utilizes natural gas for electrical generation in the City of Los Angeles. **Map 3.11-3**, located in Chapter 8.0, shows the gas utility service areas for the SCAG region.

Electricity. Local electricity distribution service is provided to customers within the SCAG region by both Investor-Owned Utilities (IOUs) and Publicly Owned Utilities (POUs). **Map 3.11-4**, located in the map chapter, shows the electric utility service areas for the SCAG region and **Table 3.11-9** shows the energy mix for these service providers. The two IOUs operating in the region are Southern California Edison (SCE) and San Diego Gas and Electric (SDG&E). SCE is the largest electricity utility in Southern California with a service area that covers all or nearly all of Orange, San Bernardino, and Ventura Counties, and most of Los Angeles and Riverside Counties. The SCE territory also includes areas outside of SCAG including Inyo, Tulare, and Mono County as well as portions of Kern, Fresno, and Tolumne Counties. Southern California Edison delivers 78 percent of the retail electricity sales to residents and businesses in the SCAG region. SDG&E provides local distribution service to the southern portion of Orange County.[38] There are also 12 publicly owned utilities in the SCAG region including Anaheim, Azusa, Banning, Burbank, Cerritos, Colton, Glendale, Los Angeles, Pasadena, Riverside, and Vernon, and the Imperial Irrigation District. Together, these municipal utilities deliver electricity to over 2 million customers in the Southern California region that spans an area of 7,000 square miles and has a total population that exceeds 5 million.[39] The Los Angeles Department of Water and Power (LADWP) is the largest of the publicly owned electric utilities in Southern California, providing approximately 20 percent of the region's electricity.[40]

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[37]California Energy Commission, California Natural Gas Supply by Source, http://www.energy.ca.gov/naturalgas/statistics/gas_supply_by_source.html, accessed August 22, 2011.

[38]Southern California Gas Company, *Company Profile*, available at: http://www.socalgas.com/about-us/company-info.shtml, accessed August 22, 2011.

[39]Southern California Public Power Authority. *2009 Annual Report,* available at: http://www.scppa.org/Downloads/Annual%20Report/SCPPA_AR09.pdf, accessed August 22, 2011.

[40]California Energy Commission. *California Energy Demand 2010-2020 Adopted Forecast, Commission Report. (December 2009)*, CEC-200-2009-012-CMF, available at: http://www.energy.ca.gov/2009publications/CEC-200-2009-012/CEC-200-2009-012-CMF.PDF, accessed August 22, 2011.

TABLE 3.11-9: ENERGY MIX FOR ELECTRICITY SERVICE PROVIDERS IN THE SCAG REGION

		Source									
		Eligible Renewable					Non-Renewable				
Electricity Provider	County	Biomass and Waste	Geothermal	Small Hydro-electric	Solar	Wind	Coal	Large Hydro-electric	Natural Gas	Nuclear	Unspecified/a/
Azusa Light & Power	Los Angeles	--	--	--	--	13%	66%	6%	--	8%	7%
Burbank Water & Power	Los Angeles	<1%	<1%	1%	--	3%	38%	2%	37%	6%	13%
City of Cerritos/b/	Los Angeles	2%	9%	1%	1%	3%	10%	5%	51%	18%	<1%
City of Industry	Los Angeles	2%	9%	1%	1%	3%	10%	5%	51%	18%	<1%
City of Vernon Municipal Light Department	Los Angeles	2%	--	--	--	--	--	--	62%	8%	28%
Glendale Water & Power	Los Angeles	4%	2%	2%	<1%	8%	30%	5%	35%	7%	7%
Los Angeles Department of Water & Power	Los Angeles	2%	1%	6%	<1%	5%	41%	4%	30%	11%	<1%
Pasadena Water & Power	Los Angeles	8%	2%	--	--	6%	54%	4%	13%	6%	7%
Anza Electric Cooperative, Inc.	Riverside	--	--	--	--	--	92%	1%	7%	--	--
City of Banning Electric Department	Riverside	--	25%	--	--	--	46%	1%	--	14%	14%
City of Corona Department of Water & Power	Riverside	<1%	2%	6%	<1%	2%	32%	24%	31%	35	--
City of Riverside	Riverside	<1%	17%	<1%	<1%	<1%	50%	2%	1%	16%	13%
Moreno Valley Utility	Riverside	<1%	1%	--	<1%	1%	33%	18%	42%	5%	--
Morongo Band of Mission Indians	Riverside	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
City of Anaheim Public Utilities Department	Orange	1%	5%	<1%	<1%	3%	68%	3%	19%	--	--
San Diego Gas & Electric	Orange	3%	<1%	<1%	<1%	7%	7%	3%	62%	18%	--
Bear Valley Electric Service	San Bernardino	--	<1%	<1%	--	<1%	34%	18%	42%	5%	--
City of Needles	San Bernardino	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Colton Electric	San Bernardino	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rancho Cucamonga Municipal Utility	San Bernardino	--	2%	6%	--	2%	32%	24%	31%	3%	--
Victorville Municipal Utilities Services	San Bernardino	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Imperial Irrigation District	Imperial	--	--	8%	--	--	29%	10%	48%	5%	--
Southern California Edison	All SCAG counties	2%	9%	1%	1%	3%	10%	5%	51%	18%	<1%

/a/ Unspecified = electricity from transactions that are not traceable to specific generation sources
/b/ Southern California Edison supplies energy to the City of Cerritos.
SOURCE: California Energy Commission, Power Content Label, October, 2011.

Alternative Energy Sources

Alternative Fuels. Alternative fuels, as defined by the Energy Policy Act of 1992, include ethanol, natural gas, propane, hydrogen, biodiesel, electricity, methanol, and p-series fuels. These fuels are being used worldwide in a variety of vehicle applications.[41] Use of these fuels for transportation can generally reduce air pollutant emissions and can be domestically produced and derived from renewable sources. The Energy Policy Act of 2005 further directed the Department of Energy to carry out a study to plan for the transition from petroleum to hydrogen in a significant percentage of vehicles sold by 2020. Alternative fueling stations within the SCAG region are shown on **Map 3.11-5**, located in Chapter 8.0. As shown therein, there are 529 alternative fueling stations within the SCAG region. The following descriptions of alternative fuels are from the United States Department of Energy's Alternative Fuels Data Center website.

Ethanol. Ethanol is a clear, colorless liquid. Blends of at least 85 percent ethanol are considered alternative fuels under the Energy Policy Act E85. A blend of 85 percent ethanol and 15 percent gasoline is used in flexible fuel vehicles (FFVs) that are currently offered by most major auto manufacturers. FFVs can run on gasoline, E85, or any combination of the two and qualify as alternative fuel vehicles under Energy Policy Act regulations.

Natural Gas. Natural gas is a mixture of hydrocarbons—mainly methane (CH4)—and is produced either from gas wells or in conjunction with crude oil production. The interest in natural gas as an alternative fuel for automobiles stems mainly from its clean burning qualities, its domestic resource base, and its commercial availability to end users. Because of the gaseous nature of this fuel, it must be stored onboard a vehicle in either a compressed gaseous state (CNG) or in a liquefied state (LNG).

Propane. Propane is produced as a by-product of natural gas processing and petroleum refining. Propane or liquefied petroleum gas (LPG) is a popular alternative fuel choice for vehicles because there is already an infrastructure of pipelines, processing facilities, and storage for its efficient distribution.

Hydrogen. Hydrogen is the simplest and lightest fuel is hydrogen gas (H2). Hydrogen is in a gaseous state at atmospheric pressure and ambient temperatures. Hydrogen is being explored for use in combustion engines and fuel cell electric vehicles. The ability to create hydrogen from a variety of resources and its clean-burning properties make it a desirable alternative fuel. Although there is no significant transportation distribution system currently for hydrogen transportation use, hydrogen could be transported and delivered using the established hydrogen infrastructure; for significant market penetration, the infrastructure will need further development.

Biodiesel. Biodiesel is a domestically produced, renewable fuel that can be manufactured from vegetable oils, animal fats, or recycled restaurant greases. Biodiesel is safe, biodegradable, and reduces serious air pollutants such as particulates, carbon monoxide, hydrocarbons, and air toxics. According to the U.S. Department of Energy, pure biodiesel (B100) is considered an alternative fuel under Energy Policy Act. Lower-level biodiesel blends are not considered alternative fuels, but covered fleets can earn one Energy Policy Act credit for every 450 gallons of B100 purchased for use in blends of 20 percent or higher.

Electricity. Electricity can be used as a transportation fuel to power battery electric and fuel cell vehicles. When used to power electric vehicles or EVs, electricity is stored in an energy storage device such as a battery. Fuel cell vehicles use electricity produced from an electrochemical reaction that takes place when hydrogen and oxygen are combined in the fuel cell "stack." The production of electricity using fuel cells takes place without combustion or pollution and leaves only two byproducts, heat and water.

[41] U.S. Department of Energy, Alternative Fuels Data Center, Retrieved October 29, 2007 from http://www.eere.energy.gov/afdc/fuels/index.html.

Electric vehicles have several different charging systems: 120-volt, 240-volt, direct-current, and inductive charging. An electric vehicle that accepts 120-volt power can do so from any standard electrical outlet with a 12- or 16-amp dedicated branch circuit (with no other receptacles or loads on the circuit). A 240-volt system requires the installation of a home charging station and is available at most public charging stations. Direct-current (DC) fast charging equipment (480 V) provides 50 kW to the battery. This option enables charging along heavy traffic corridors and at public stations. Inductive charging equipment was installed for all-electric vehicles in the early 1990s, such as the GM/Saturn EV-1, Toyota RAV4 EV, and the Chevy S10, and is still being used in certain areas. Some companies are working on inductive charging options for future electric drive vehicles. The most common types of electric vehicles use either 120-volt or 240-volt electrical systems

The U.S. Department of Energy's Advanced Vehicle Testing Activity (AVTA) promotes the use of electric vehicles in commercial fleets in the United States. During 1996, AVTA requested and received proposals from interested groups to become qualified vehicle testers (QVT). SCE headed one QVT. According to SCE, California's approximately 20,000 megawatts of excess off-peak (nighttime) electricity capacity would allow the charging of millions of electro-drive technologies without the need for new power generation facilities.[42]

Methanol. Methanol, also known as wood alcohol, can be used as an alternative fuel in flexible fuel vehicles that run on M85 (a blend of 85 percent methanol and 15 percent gasoline). However, it is not commonly used because automakers are no longer supplying methanol-powered vehicles. Today most of the world's methanol is produced by a process using natural gas as a feedstock. However, the ability to produce methanol from non-petroleum feedstocks such as coal or biomass is of interest for reducing petroleum imports.

P-Series fuel. P-Series fuel is a unique blend of natural gas liquids (pentanes plus), ethanol, and the biomass-derived co-solvent methyltetrahydrofuran (MeTHF). P-Series fuels are clear, colorless, 89-93 octane, liquid blends that are formulated to be used in flexible fuel vehicles (FFV's). P-Series are designed to be used alone or freely mixed with gasoline in any proportion inside the FFV's gas tank. These fuels are not currently being produced in large quantities and are not widely used.

Renewable Electricity. Electricity supply reliability depends, in part, on the diversity of energy sources. In 1978, congress passed the Public Utilities Regulatory Policies Act (PURPA). The act defines facilities that use alternative or renewable energy sources as "qualifying facilities." It provides financial incentives for their installation and requires utilities to sign long-term power purchase contracts with qualifying facilities. The California Public Utilities Commission (CPUC) has adopted contract incentives to assist qualifying facilities.

Qualifying facilities built in the SCAG region include wind and solar installations in Riverside and San Bernardino Counties and a number of cogeneration units around the region. **Map 3.11-6**, located in Chapter 8.0 (Maps), shows the location of solar and wind projects. Original provisions of PURPA encouraged the construction of biomass-to-energy facilities, which use materials such as agricultural and wood waste as fuel for energy production.

[42]Southern California Edison, Electric Transportation website. Retrieved October 29, 2007 fromhttp://www.sce.com/ Powerand Environment/ElectricTransportationNew/Energy/.

THRESHOLDS OF SIGNIFICANCE

Based on CEQA Appendix G and as appropriate for the 2012-2035 RTP/SCS, the Plan would have a significant impact related to energy if it would:

- Substantially increase the consumption of electricity, natural gas, gasoline, diesel, or other non-renewable energy types between the current conditions and 2035;
- Use substantial amounts of electricity and natural gas, thereby requiring the construction of new facilities and sources of energy or major improvements to local infrastructure;
- Cause the use of large amounts of electricity and natural gas in a wasteful manner;
- Cause a cumulatively considerable increase in energy consumption and associated environmental effects; and/or
- Uncover and potentially sever underground utility lines.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the Plan on energy consumption and associated environmental effects. Estimated energy consumption in 2035 is expected to represent the most conservative (i.e., highest energy consumption of any year in the Plan) because population and employment are projected to be higher in this year than in any earlier year and future conservation efforts may not be fully quantified at this time. Also, no estimate is made of the impact of energy efficiency and conservation measures which are likely to be adopted, resulting in energy consumption lower than that projected in this chapter.

Expected future transportation fuel consumption, electricity, and natural gas consumption was determined by transportation modeling, while other uses were estimated for future year 2035 using the Rapid Fire Model Version 2.0, which provides estimated fuel consumption for the 2012-2035 RTP/SCS. Energy consumption for the other elements of the transportation plan was also estimated and evaluated. The electricity use rate for each county was based on the existing electricity consumption for residential and non-residential uses obtained from the California Energy Commission (CEC).[43] Existing dwelling units and employees in each county were used to obtain an electricity usage rate per dwelling unit and employee. Then, the electricity usage rate was multiplied by the correlating dwelling units and employees for the No Project Alternative and the 2012-2035 RTP/SCS to obtain the total electricity consumption in gigawatt (GWh)-hours for each county.

Natural gas consumption was obtained from the CEC, which provides data by county.[44] Existing dwelling units and employees in each county were used to obtain a natural gas usage rate per dwelling unit and employee. The natural gas use rate was multiplied by the correlating numbers for the No Project Alternative and the 2012-2035 RTP/SCS to obtain the total natural gas use in standard cubic feet per year each county.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for

[43]California Energy Commission, Electricity Consumption by County (2010), accessed November, 2011, available at: http://ecdms.energy.ca.gov/elecbycounty.aspx

[44]California Energy Commission, Gas Consumption by County accessed November, 2011, available at: http://www.ecdms.energy.ca.gov/gasbycounty.aspx.

this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of energy resources includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan were adopted (No Project). This evaluation is not included in the determination of the significance of impacts (which is based on a comparison to existing conditions); however, it provides a meaningful perspective on the expected effects of the 2012-2035 RTP/SCS.

Determination of Significance

The methodology for determining the significance of energy impacts compares existing conditions to the expected future energy consumption with the Plan. The criteria above were applied to compare current energy usage to expected future (2035) Plan conditions.

Implementation of the 2012-2035 RTP/SCS would affect the use of energy resources in the SCAG region. The analysis of these impacts is programmatic at the regional level. The Plan would result in energy impacts as a result of the following: energy demands for construction of transportation projects and development; energy demands for operation of the regional transportation system and the growing energy demand from growth associated with implementation of the 2012-2035 RTP/SCS. Project-specific impacts vary and appropriate mitigation measures would need to be developed on a project-by-project basis, as appropriate.

IMPACTS

Impact 3.11-10: Construction necessary to implement the 2012-2035 RTP/SCS may uncover and potentially sever underground utility lines (electric and natural gas).

Any groundbreaking in the SCAG region has the potential to encounter underground utility lines and break those lines. Transportation projects such as new and widened highways and arterials, grade separations, and light and heavy rail projects, all involve excavation that could sever existing utility lines. In addition construction activities associated with growth associated would result in similar impacts. As part of the review and approval process local agencies normally require project sponsors to identify the locations of existing utility lines so that they may be avoided. Implementation of Mitigation Measure **MM-PS57** would reduce this underground utility line impacts to less than significance.

Impact 3.11-11: Potential to use electricity, natural gas, gasoline, diesel, and other non-renewable energy types in the construction and expansion of the regional transportation system and anticipated development.

Construction of the new elements of the regional transportation system as well as construction associated with anticipated development would involve the use of diesel-powered heavy equipment, portable diesel generators, and other battery-operated support equipment, as well as electricity from the existing grid. There activities would result in the irreversible consumption of diesel fuel (and other fuels).

As mentioned in the environmental setting above, there is a potential for a significant decline in the amount of economically recoverable petroleum within the next ten years. If this decrease occurs, fuel prices (for all

grades of fuel) could increase dramatically, and the cost of owning and maintaining a vehicle could also increase dramatically. To help reduce the possible effects of this situation, greater use of alternative fuels, public transit, and non-motorized transportation options must be undertaken.

Forecasted urban development and growth that would be accommodated by the transportation investments, together with the increased mobility provided by the 2012-2035 RTP/SCS, would contribute to significant impacts related to non-renewable energy resources. **Table 3.11-10** summarizes the expected fuel consumption, as predicted by SCAG's Rapid Fire Model Version 2.0, between 2011 and 2035 with the investments in the 2012-2035 RTP/SCS and without (the No Project Alternative).

TABLE 3.11-10: PROJECTED SCAG REGION TRANSPORTATION FUEL CONSUMPTION

Alternative	Fuel Consumed (gallons per year)	Fuel Consumed (1000 gallons per day)	Percent Increase Over Existing
Existing	6.8 billion	18,630	--
No Project (Year 2035)	7.4 billion	20,274	8.8%
2012-2035 RTP/SCS (Year 2035)	5.6 billion	15,342	**-17.6%**

SOURCE: SCAG Transportation Modeling 2011.

Implementation of the 2012-2035 RTP/SCS would result in changes to land use patterns as it focuses on urban infill growth and walkable, mixed-use communities in existing and planned transit areas. In addition to a reduction in VMT, more mixed-use, walkable and urban infill development would accommodate a higher proportion of growth in more energy-efficient housing types like townhomes, apartments, and smaller single-family homes, as well as more compact commercial building types. As indicated in **Table 3.11-11**, forecast urban development and growth that would be accommodated by the transportation investments in the 2012-2035 RTP/SCS would result in less overall use of energy resources in 2035 than in 2011.

TABLE 3.11-11: ELECTRICITY AND NATURAL GAS CONSUMPTION FOR 2011, 2035 NO PROJECT AND 2035 WITH PROJECT

	Electricity (GWh/year)			Natural Gas (Million therms/year)		
County	2011	2035 No Project	2035 Plan	2011	2035 No Project	2035 Plan
Ventura	3,670	3,817	3,709	151.7	157.1	154.3
Riverside	9,501	11,045	10,916	361.8	419.1	411.6
Imperial	906	1,186	1,141	28.8	37.1	35.4
Orange	13,251	12,882	12,498	434.4	427.1	420.4
Los Angeles	44,198	44,069	42,598	1,789.4	1,791.0	1,762.1
San Bernardino	8,489	9,145	8,860	373.1	403.6	390.7
SCAG TOTAL	**80,013**	**82,144**	**79,723**	**3,139.0**	**3,235.1**	**3,714.7**

Electricity usage rates obtained from the California Energy Commission, California Electricity Consumption by County in 2011. Based on CEC data, electricity usage per capita will remained relatively constant.
Natural gas usage rates from the California Energy Commission, California Energy Demand 2010-2020 Staff Energy Demand Forecast. Based on CEC data, natural gas usage per capita will remain relatively constant.
SOURCE: SCAG (Rapid Fire Model), 2011; TAHA, 2011.

It is beyond the scope of this analysis to project how increased energy demand will be met, but public and private energy providers should continue their current long-range planning processes to assure that there is no shortfall. A variety of energy sources are being pursued, and recent state actions (see Regulatory Setting) should help to meet the growth in energy demand while minimizing associated environmental impact and reducing dependence on fossil fuels. The 2012-2035 RTP/SCS's emphasis on compact land use and growth patterns that facilitate transit and non-motorized transportation are anticipated to result in less energy consumption than if no plan were in place. Nonetheless, an increase in energy resources will be necessary to support the growing population. Implementation of Mitigation Measures **MM-PS57** through **MM-PS124** would reduce non-renewable energy consumption impacts; however, impacts would remain significant.

Cumulative Impacts 3.11-12 Potential to contribute to a cumulatively considerable increase in non-renewable energy use.

Worldwide energy consumption is increasing exponentially with third world countries increasingly adopting a western lifestyle. Worldwide supplies of oil are finite and the extent of existing reserves is unclear. The SCAG region accounts for about half of California's population and about half of its energy demand. As noted in the Regulatory Setting, the State (including the SCAG region) is aggressively pursuing GHG reduction that will also result in decreased energy consumption. Nonetheless the anticipated demand for energy would contribute to depleting energy reserves. **This is anticipated to be a cumulatively significant impact.**

MITIGATION MEASURES

Mitigation Measures **MM-PS57** through **MM-PS113** can and should be implemented by local jurisdictions and project sponsors as appropriate (for both development and transportation projects) as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions. Mitigation Measures **MM-PS114** through **MM-PS124** shall be implemented by SCAG over the lifetime of the 2012-2035 RTP/SCS.

MM-PS57: Prior to construction, the project implementation agency can and should identify the locations of existing utility lines. The contractor shall avoid all known utility lines during construction.

MM-PS58: In reviewing projects Lead Agencies and project sponsors can and should consider energy implications of construction processes. In general the most energy efficient construction process and long-term operational design can and should be selected unless there is an overriding reason why not.

MM-PS59: Local jurisdictions can and should include energy analyses in environmental documentation and general plans with the goal of conserving energy through the wise and efficient use of energy. For any identified energy impacts, appropriate mitigation measures can and should be developed and monitored. SCAG recommends the use of Appendix F, Energy Conservation, of the *CEQA Guidelines.*

MM-PS60: Project sponsors can and should consider the most cost-effective alternative and renewable energy generation facilities.

MM-PS61: Project sponsors can and should require that projects use efficient lighting. (Fluorescent lighting uses approximately 75% less energy than incandescent lighting to deliver the same amount of light.)

MM-PS62: Project sponsors can and should require measures that reduce the amount of water sent to the sewer system. (Reduction in water volume sent to the sewer system means less water has to be treated and pumped to the end user, thereby saving energy.)

MM-PS63: Project sponsors can and should pursue incentives to encourage the use of energy efficient equipment and vehicles.

MM-PS64: State and federal lawmakers and regulatory agencies can and should pursue the design of programs to either require or incentivize the expanded availability including the expansion of alternative fuel filling stations and use of alternative-fuel vehicles to reduce the impact of shifts in petroleum fuel supply and price.

MM-PS65: Local jurisdictions can and should consider various best practices and technological improvements that can reduce the consumption of fossil fuels, such as:

- Expanding light-duty vehicle retirement programs
- Increasing commercial vehicle fleet modernization
- Implementing driver training module on fuel consumption
- Replacing gasoline powered mowers with electric mowers
- Reducing idling from construction equipment
- Incentivizing alternative fuel vehicles and equipment
- Developing infrastructure for alternative fueled vehicles
- Increasing use and mileage of High Occupancy Vehicle (HOV), High Occupancy Toll (HOT) and dedicated Bus Rapid Transit (BRT) lanes
- Implementing truck idling rule, devices, and truck-stop electrification
- Requiring electric truck refrigerator units
- Reducing locomotives fuel use
- Modernizing older off-road engines and equipment
- Implementing cold ironing at ports
- Encouraging freight mode shift
- Limit use and develop fleet rules for construction equipment
- Requiring zero-emission forklifts
- Developing landside port strategy with alternative fuels, clean engines, and electrification

MM-PS66: Local jurisdictions or agencies with purview over utilities can and should, as practical and feasible, streamline permitting and provide public information to facilitate accelerated construction of geothermal, solar and wind power generation facilities and transmission line improvements.

MM-PS67: Utilities can and should increase capacity of existing transmission lines to meet forecast demand that supports sustainable growth, where feasible and appropriate in coordination with local planning agencies.

MM-PS68: Project sponsors can and should support programs to reduce single occupancy vehicle trips such as telecommuting, ridesharing, alternative work schedules, and parking cash-outs.

MM-PS69: Project sponsors can and should submit projected electricity and natural gas demand calculations to the local electricity or natural gas provider, for any project anticipated to require substantial utility consumption. Any infrastructure improvements necessary for project construction can and should be completed according to the specifications of the energy provider.

MM-PS70: Project sponsors can and should encourage, to the extent practical and feasible, ensure that new buildings incorporate solar panels in roofing and tap other renewable energy sources to offset new demand on conventional power sources. For example, transit providers can and should, as feasible, assure that designers of new transit stations incorporate solar panels in roofing.

MM-PS71: Project sponsors can and should encourage energy efficient design for buildings, potentially including strengthening local building codes for new construction and renovation to achieve a higher level of energy efficiency. This may include strengthening local building codes for new construction and renovation to require a higher level of energy efficiency.

MM-PS72: Local jurisdictions can and should seek funding through utility-sponsored programs to conduct energy efficiency "tune-ups" of existing buildings, as practical and feasible, by checking, repairing, and readjusting heating, ventilation, air conditioning, lighting, hot water equipment, insulation and weatherization.

MM-PS73: Project sponsors can and should provide individualized energy management services for large energy users.

MM-PS74: Local jurisdictions and project sponsors can and should encourage the use of energy efficient appliances and office equipment.

MM-PS75: Project sponsors can and should pursue incentives and technical assistance for lighting efficiency.

MM-PS76: Local jurisdictions can and should provide public education and publicity about energy efficiency programs and incentives in cooperation with local utility providers.

MM-PS77: If a carbon trading system is established, a lead agency may consider whether carbon offsets would be an appropriate means of project mitigation. The project sponsor could, for example, fund off-site projects (e.g., alternative energy projects) that will reduce carbon emissions, or could purchase "credits" from another entity that will fund such projects. The lead agency can and should ensure that any mitigation taking the form of carbon offsets is specifically identified and that such mitigation will in fact occur.

MM-PS78: Local jurisdictions can and should encourage the integration of green building measures into project design and zoning such as those identified in the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED), Energy Star Homes, Green Point Rated Homes, and the California Green Builder Program. Energy saving measures for new and remodeled buildings include:

- Using energy efficient materials in building design, construction, rehabilitation, and retrofit
- Encouraging new development to exceed Title 24 energy efficiency requirements
- Developing Cool Communities measures including tree planting and light-colored roofs. These measures focus on reducing ambient heat, which reduces energy consumption related to air conditioning and other cooling equipment.
- Utilizing efficient commercial/residential space and water heaters: This could include the advertisement of existing and/or development of additional incentives for energy efficient appliance purchases to reduce excess energy use and save money. Federal tax incentives are provided online at http://www.energystar.gov/index.cfm?c= Productspr_tax_credits.
- Encouraging landscaping that requires no additional irrigation: utilizing native, drought tolerant plants can reduce water usage up to 60 percent compared to traditional lawns.
- Encouraging combined heating and cooling, also known as cogeneration, in all buildings.
- Encouraging neighborhood energy systems, which allow communities to generate their own electricity
- Orienting streets and buildings for best solar access

- Encouraging buildings to obtain at least 20 percent of their electric load from renewable energy

MM-PS79: Project sponsors can and should install energy efficient lighting (e.g., light emitting diodes (LEDs)), heating and cooling systems, appliances, equipment, and control systems.

MM-PS80: Project sponsors can and should use passive solar design, e.g., orient buildings and incorporate landscaping to maximize passive solar heating during cool seasons, minimize solar heat gain during hot seasons, and enhance natural ventilation.

MM-PS81: Project sponsors can and should design buildings to take advantage of sunlight.

MM-PS82: Project sponsors can and should install light colored "cool" roofs and cool pavements.

MM-PS83: Install efficient lighting, (including LEDs) for traffic, street and other outdoor lighting.

MM-PS84: Project sponsors can and should reduce unnecessary outdoor lighting.

MM-PS85: Project sponsors can and should use automatic covers, efficient pumps and motors, and solar heating for pools and spas.

MM-PS86: Project sponsors can and should provide education on energy efficiency to residents, customers and/or tenants.

MM-PS87: Project sponsors can and should use paving materials with a Solar Reflective Index (SRI) of at least 29, or open grid paving systems.

MM-PS88: Project sponsors can and should use roofing material with SRI of at least 29 on covered parking (underground, beneath decking or roofs, or beneath a building).

MM-PS89: Local jurisdictions can and should adopt a Heat Island Mitigation Plan that requires cool roofs, cool pavements, and strategically placed shade trees, and actively inspect and enforce state requirements for cool roofs on non-residential re-roofing projects.

MM-PS90: Local jurisdictions can and should pursue policies and programs to improve energy efficiency of existing buildings.

MM-PS91: Local jurisdictions can and should require the performance of energy audits for residential and commercial buildings prior to completion of sale, and that audit results and information about opportunities for energy efficiency improvements be presented to the buyer.

MM-PS92: Local jurisdictions can and should create an outreach and incentive program to promote energy efficiency and conservation in the community, including:

- Launch an "energy efficiency challenge" campaign for community residents;
- Implement a low-income weatherization assistance program;
- Implement conservation campaigns specifically targeted to residents, and separately to businesses;
- Promote the purchase of Energy Star® appliances, including, where feasible, incentive grants and vouchers;
- Promote participation in the local "Green Business" program;
- Distribute free CFL bulbs or other efficiency fixtures to community members;

- Offer exchange programs for high-energy-use items, such as halogen torchiere lamps;
- Adopt an ordinance requiring energy upgrades at time of property sale.

MM-PS93: Project sponsors can and should install solar, wind, and geothermal power systems and solar hot water heaters.

MM-PS94: Project sponsors can and should install solar panels on unused roof and ground space and over carports and parking areas.

MM-PS95: Project sponsors can and should include energy storage where appropriate to optimize renewable energy generation systems and avoid peak energy use.

MM-PS96: Project sponsors can and should use combined heat and power (CHP) in appropriate applications.

MM-PS97: Local jurisdictions can and should identify possible sites for production of renewable energy (such as solar, wind, small hydro, and biogas), as compatible with surrounding uses, and protect and promote that use, including:

- Designate suitable sites to prioritize their development for renewable energy generation;
- Evaluate potential land use, environmental, economic, and other constraints on that use, and mitigate such constraints, as feasible;
- Adopt measures to protect the renewable energy use of the sites and their resources, such as utility easements, rights-of-way, and land set-a-sides.

MM-PS98: Local jurisdictions can and should allow renewable energy projects in areas zoned for open space, where consistent with the Open Space element, and other uses and values.

MM-PS99: Local jurisdictions can and should promote and require renewable energy generation, and co-generation projects where feasible and appropriate.

MM-PS100: Local jurisdictions can and should require that new office/retail/commercial or industrial development, or major rehabilitation (e.g., additions of 25,000 square feet commercial, or 100,000 square feet industrial) incorporate renewable energy generation either on- or off-site to provide 15 percent or more of the project's energy needs.

MM-PS101: Local jurisdictions can and should promote and encourage cogeneration projects for commercial and industrial facilities, provided they meet all applicable air quality standards and provide a net reduction in GHG emissions associated with energy production.

MM-PS102: Local jurisdictions can and should require that, where feasible, all new buildings be constructed to allow for easy, cost-effective installation of solar energy systems in the future, using such "solar-ready" features as:

- Designing the building to include optimal roof orientation (between 20 to 55 degrees from the horizontal), with sufficient south-sloped roof surface;
- Clear access without obstructions (chimneys, heating and plumbing vents, etc.) on the south sloped roof;
- Designing the roof framing to support the addition of solar panels;
- Installation of electrical conduit to accept solar electric system wiring;
- Installation of plumbing to support a solar hot water system and provision of space for a solar hot water storage tank.

MM-PS103: Local jurisdictions can and should require that residential projects of 6 units or more participate in the California Energy Commission's New Solar Homes Partnership, which provides rebates to developers who offer solar power in at least 50 percent of new units, or a program with similar provisions.

MM-PS104: Local jurisdictions can and should require that any building constructed in whole or in part with local jurisdiction funds incorporate passive solar design features, such as daylighting and passive solar heating, where feasible.

MM-PS105: Local jurisdictions can and should protect active and passive solar design elements and systems from shading by neighboring structures and trees, as consistent with existing tree shading requirements.

MM-PS106: Local jurisdictions can and should provide, where feasible, creative financing for renewable energy projects, including subsidized or other low-interest loans, and the option to pay for system installation through long-term assessments on individual property tax bills.

MM-PS107: Local jurisdictions can and should pursue partnerships with other governmental entities and with private companies and utilities to establish incentive programs for renewable energy.

MM-PS108: Local jurisdictions can and should establish and maintain a clearinghouse of information on available funding alternatives for renewable energy projects, rates of return, and other information to support developers and community members interested in pursuing renewable energy projects.

MM-PS109: Local jurisdictions can and should establish targets for the purchase of renewable energy, in excess of the state Renewable Portfolio Standards, using such mechanisms as green tags or renewable energy certificates.

MM-PS110: Local jurisdictions can and should evaluate the feasibility and effectiveness of using Community Choice Aggregation as a model for providing renewable energy to meet the community's electricity needs, including potential partnerships with other jurisdictions.

MM-PS111: Local jurisdictions can and should prepare and implement a comprehensive plan to improve energy efficiency of municipal facilities, including:

- Conduct energy audits for all municipal facilities;
- Retrofit facilities for energy efficiency where feasible and when remodeling or replacing components, including increased insulation, installing green or reflective roofs and low-emissive window glass;
- Implement an energy tracking and management system;
- Install energy-efficient exit signs, street signs, and traffic lighting;
- Install energy-efficient lighting retrofits and occupancy sensors, and institute a "lights out at night" policy;
- Retrofit heating and cooling systems to optimize efficiency (e.g., replace chillers, boilers, fans, pumps, belts, etc.);
- Install Energy Star® appliances and energy-efficient vending machines;
- Improve efficiency of water pumping and use at municipal facilities, including a schedule to replace or retrofit system components with high-efficiency units (i.e., ultra-low-flow toilets, fixtures, etc.);
- Provide chilled, filtered water at water fountains and taps in lieu of bottled water;
- Install a central irrigation control system and time its operation for off-peak use;

- Adopt an accelerated replacement schedule for energy inefficient systems and components.

MM-PS112: Local jurisdictions can and should require that any newly constructed, purchased, or leased municipal space meet minimum standards as appropriate, such as:

- Requirements for new commercial buildings to meet LEED criteria established by the U.S. Green Building Council;
- Requirements for new residential buildings to meet criteria of the Energy Star® New Homes Program established by USEPA;
- Incorporation of passive solar design features in new buildings, including daylighting and passive solar heating;
- Retrofitting of existing buildings to meet standards under Title 24 of the California Building Energy Code, or to achieve a higher performance standard as established by the local jurisdiction;
- Retrofitting of existing buildings to decrease heat gain from non-roof impervious surfaces with cool paving, landscaping, and other techniques.
- Training & Support: Local jurisdictions or agencies can and should ensure that staff receives appropriate training and support to implement objectives and policies to reduce GHG emissions, including:
- Provide energy efficiency training to design, engineering, building operations, and maintenance staff;
- Provide information on energy use and management, including data from the tracking and management system, to managers and others making decisions that influence energy use;
- Provide energy design review services to departments undertaking new construction or renovation projects, to facilitate compliance with LEED standards.

MM-PS113: Local jurisdictions can and should collaborate with local energy suppliers and distributors to establish energy conservation programs, Energy Star® appliance change-out programs, rebates, vouchers, and other incentives to install energy-efficient technology and products and to cooperate on advertising.

MM-PS114: SCAG shall encourage methane recovery in local landfills and wastewater treatment plants to generate electricity.

MM-PS115: SCAG shall continue to consider energy uncertainty impacts prior to the development of the next RTP/SCS. Topics that shall be considered include:

- How the price and availability of transportation fuels affects revenues and demand;
- How increases in fuel efficiency could affect revenues and emissions;
- How the cost of commuting and personal travel affects mode choice and growth patterns;
- How the cost of goods movement affects international trade and employment; or
- How the escalation of fuel prices affects the cost of infrastructure construction, maintenance and operation.

MM-PS116: SCAG shall convene key stakeholders to evaluate and where feasible, recommend transportation measures such as congestion pricing, a refined regional goods movement system and technologies that reduce fossil fuel consumption.

MM-PS117: SCAG shall encourage clean post-recycle conversion technologies to produce energy or technologies that offset energy use or air emissions.

MM-PS118: SCAG shall continue to develop energy efficiency and green building guidance to provide direction on specific approaches and models and to specify levels of performance for regionally significant projects to be consistent with regional plans.

MM-PS119: SCAG shall encourage the federal and state government to increase clean, cost-effective, reliable, domestic renewable energy generation, such as solar and wind turbines.

MM-PS120: SCAG shall continue to promote electric vehicle penetration throughout the region through ongoing electric vehicle readiness efforts.

MM-PS121: SCAG shall encourage the federal government to increase the Corporate Average Fuel Economy (CAFE) to a level that will reduce the region's dependence on petroleum and reduce greenhouse gas emissions.

MM-PS122: SCAG shall continue to pursue partnerships with Southern California Edison, municipal utilities, and the California Public Utilities Commission to promote energy efficiency and reduce greenhouse gas emissions in the region.

MM-PS123: SCAG shall continue to develop, in coordination with the California Air Resources Board, a data and information collection and analysis system that provides an understanding of energy demand and greenhouse gas emissions in the SCAG region.

MM-PS124: SCAG shall continue to work with local jurisdictions and energy providers, through its Energy and Environment Committee, and administration of the Clean Cities Program as well as by other means, to encourage regional-scale planning for improved energy management. Future impacts to energy shall be minimized through cooperative planning, and information sharing within the SCAG region.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Utility Lines

Impacts related to the potential to uncover and sever underground utility lines were determined to be significant without mitigation. Implementation of Mitigation Measure **MM-PS57** would reduce the impacts to less than significance.

Non-renewable Energy Consumption

Implementation of Mitigation Measures **MM-PS58** through **MM-PS63** would reduce potential impacts to energy sources during construction and expansion of the transportation system and development in the region. However, given the large amount of construction anticipated for the region, the energy that would be consumed by construction is anticipated to be significant. Therefore, impacts to energy use would remain significant after mitigation.

Cumulative Impact

Implementation of Mitigation Measures **MM-PS64** through **MM-PS124** would reduce the cumulatively considerable impacts related to consumption of non-renewable energy. However, given the current and anticipated future demand on finite energy resources, impacts would remain significant after mitigation.

COMPARISION WITH THE NO PROJECT ALTERNATIVE

In the No Project Alternative, the regional population is projected to be the same as the Plan, but no regional transportation investments would be made beyond the existing programmed projects. The population distribution is assumed to follow past trends, uninfluenced by additional transportation investments, resulting in a less compact growth pattern.

Direct Impacts

The No Project Alternative would result in the construction of approximately 68,040 new lane miles compared with over 74,297 new lane miles in the 2012-2035 RTP/SCS, thereby resulting in decreased consumption of non-renewable energy resources for construction activities as compared to the Plan. Less transportation-related construction under the No Project Alternative would reduce the likelihood to uncover or sever an underground utility line. The No Project Alternative's impacts would be less than the Plan for transportation projects. With a more dispersed development pattern development would be occurring in areas not previously disturbed and with fewer buried utility lines. Therefore impacts described in Impact 3.11-10 could be less under the No Project Alternative.

As mentioned above, the No Project Alternative would result in the construction of approximately 68,040 new lane miles compared with over 74,297 new lane miles in the 2012-2035 RTP/SCS. However, as shown in **Table 3.11-10** above, the total projected use of transportation fuels would be greater under the No Project Alternative than under the 2012-2035 RTP/SCS. This difference would result from greater VMT as a result of development under the No Project Alternative continuing the same patterns of growth that the region has experienced in past decades, relying heavily on growth in undeveloped agricultural lands and open spaces at the edges of cities and beyond. The No Project Alternative would consume approximately 742 square miles, as opposed to 334 square miles under the 2012-2035 RTP/SCS. The No Project Alternative would result in 547 million VMT per day by 2035, as opposed to 517 million VMT per day under the Plan. The Plan with more mixed-use, walkable communities, and urban infill development, accommodate a higher proportion of growth in more energy-efficient housing types like townhomes, apartments, and smaller single family homes, as well as more compact commercial building types. By contrast, a large proportion of standard development, such as that which is anticipated to occur under the No Project Alternative, leads to a higher proportion of larger single-family homes, which are typically less energy-efficient. Assuming the same efficiency standards for both scenarios, there would be marked differences in energy use due to land use-related variations. Compared to the No Project Alternative scenario, the Plan uses eight percent less energy per year. **The No Project Alternative's impacts would be greater than the Plan for Cumulative Impact 3.11-11.**

Cumulative Impacts

The No Project Alternative would result in a less efficient growth pattern resulting in greater consumption of energy by buildings and mobile sources. **The No Project Alternative would result in a greater demand for energy and therefore a greater cumulative impact as compared to the Plan (Impact 3.11-12).**

3.12 TRANSPORTATION, TRAFFIC & SECURITY

This section describes the current transportation system in the SCAG region, discusses the potential impacts of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategies (2012-2035 RTP/SCS or Plan) on transportation, identifies mitigation measures for the impacts, and evaluates the residual impacts.

REGULATORY FRAMEWORK

Federal

U.S. Department of Homeland Security (DHS). The DHS is charged with the responsibility of protecting the territory of the United States from terrorist attacks and responding to natural disasters. The department was established on November 25, 2002, by the Homeland Security Act of 2002. The primary mission of the Department is to (a) prevent terrorist attacks within the United States; (b) reduce the vulnerability of the United States to terrorism; and (c) minimize the damage, and assist in the recovery, from terrorist attacks that do occur within the United States.

Federal Emergency Management Agency (FEMA). In March 2003, FEMA became a department of the DHS. The primary mission of FEMA is to reduce the loss of life and property and protect the nation from all hazards, including natural disasters, acts of terrorism, and other human-made disasters, by leading and supporting the nation in a risk-based, comprehensive emergency management system of preparedness, protection, response, recovery, and mitigation.

National Response Framework (NRF). The NRF presents the guiding principles that enable all response partners to prepare for and provide a unified national response to disasters and emergencies. It establishes a comprehensive, national, all-hazards approach to domestic incident response. The National Response Plan was replaced by the NRF effective March 22, 2008.

The NRF defines the principles, roles, and structures that organize how we respond as a nation. The NRF:

- Describes how communities, tribes, states, the federal government, private-sectors, and nongovernmental partners work together to coordinate national response;
- Describes specific authorities and best practices for managing incidents; and
- Builds upon the National Incident Management System (NIMS), which provides a consistent template for managing incidents.

United States Department of Defense (DOD). The DOD has several installations within the SCAG region. In the case of a large-scale emergency, the DOD is authorized to provide resources when response and recovery requirements are beyond the capabilities of civilian authorities, and these efforts do not interfere with the DOD's core mission or ability to respond to operational contingencies.

Requests for Defense Support to Civilian Authorities (DSCA) are made through the local, county and state authorities as a request for assistance to the federal coordinating official in the appropriate lead federal agency and is normally accompanied by, or submitted after a request from the Governor for a disaster declaration from the President. The Defense Coordinating Officer coordinates the DOD resources to be provided. The California National Guard may be activated as part of the DSCA and can provide law enforcement support, crisis management and consequence management services. Activation of the National Guard for local support during emergencies is done by the Governor via the California Office of Emergency Services.

Transportation Security Administration (TSA). The TSA is a component of the DHS and is responsible for security of the nation's transportation systems. With state, local and regional partners, the TSA oversees security for highways, railroads, buses, mass transit systems, and ports. A vast majority of its resources are dedicated to aviation security and is primarily tasked with screening passengers and baggage.

Maritime Transportation Security Act of 2002. The Maritime Transportation Security Act of 2002, signed on November 25, 2002, is designed to protect the nation's ports and waterways from a terrorist attack. This law is the U.S. equivalent of the International Ship and Port Facility Security Code (ISPS), and was fully implemented on July 1, 2004. It requires vessels and port facilities to conduct vulnerability assessments and develop security plans that may include passenger, vehicle and baggage screening procedures; security patrols; establishing restricted areas; personnel identification procedures; access control measures; and/or installation of surveillance equipment.

The Disaster Mitigation Act of 2000 (DMA 2000). The DMA 2000 provides an opportunity for states, Tribes, and local governments to take a new and revitalized approach to mitigation planning. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 by adding Section 322 – Mitigation Planning. Section 322 placed new emphasis on mitigation planning requiring governments to develop and submit mitigation plans as a condition of receiving any funding from the Hazard Mitigation Grant Program (HMGP) project grants. This Act reinforces the importance of pre-disaster infrastructure mitigation planning to reduce disaster losses nationwide, and is aimed primarily at the control and streamlining of the administration of federal disaster relief and programs to promote mitigation activities.

National Incident Management System/Standardized Emergency Management System (NIMS). The NIMS is a tool for states, counties and local jurisdictions to respond to catastrophic events through better communication and coordination. NIMS provides a consistent nationwide template to enable Federal, state, local, and tribal governments and private sector and non-governmental organizations to work together effectively and efficiently to prepare for, prevent, respond to, and recover from domestic incidents, regardless of cause, size, or complexity, including acts of catastrophic terrorism.

California has a similar management system called the Standard Emergency Management System (SEMS) which is mandated under California Government Code Section §8607(a). State of California Executive Order S205 requires the State to integrate, to the extent appropriate, the NIMS, into the State's SEMS.

The NIMS Integration Center strongly recommends that all elected officials who will be interacting with multiple jurisdictions and agencies during an emergency incident to take several NIMS courses, at a minimum:

- FEMA IS700: NIMS, an Introduction
- ICS100: Introduction to Incident Command System (ICS) or equivalent

All federal, state, local, tribal, private sector and nongovernmental personnel with a direct role in emergency management and response must be NIMS and ICS trained. This includes all emergency service related disciplines such as Emergency Medical Technicians, hospitals, public health, fire service, law enforcement, public works/utilities, skilled support personnel, and other emergency management response, support and volunteer personnel.

The NIMS employs two levels of incident management, depending upon the type of incident:

- The **Incident Command System (ICS)** is a standard, on scene, all-hazard incident management system. ICS allows users to adopt an integrated organizational structure to match the needs of single or multiple incidents; and
- **Multi-Agency Coordination Systems** are a combination of facilities, equipment, personnel, procedures and communications integrated into a common framework for coordinating and supporting incident management.

ICS has been in use for over 30 years and is used for planned events, fires, earthquakes, hurricanes and acts of terrorism; ICS helps all responders communicate and coordinate logistics.

NIMS requires all emergency plans and standard operating procedures to incorporate NIMS components, principles and policies, including emergency planning, training, response, exercises, equipment, evaluation, and corrective actions. Chief elected and appointed officials in a community need to be directly involved in these NIMS preparedness elements, especially the elements that deal with exercising community emergency management policies, plans, procedures and resources.

State

California Department of Transportation (Caltrans). Caltrans, in conjunction with the California Highway Patrol (CHP), has created Transportation Management Centers (TMCs) to rapidly detect and respond to incidents while managing the resulting congestion. With the help of intelligent transportation system technologies, such as electronic sensors in the pavement, freeway call boxes, video cameras, ramp meter sensors, earthquake monitors, motorist cellular calls, and commercial traffic reports; as well as Caltrans highway crews, 911 calls and officers on patrol, the TMC provides coordinated transportation management for general commutes, special events and incidents affecting traffic. The TMCs are operated within each Caltrans district. For the SCAG region, Districts 7, 8, 11 and 12 all have TMCs.

California Emergency Management Agency (EMA). The EMA was established as part of the Governor's Office in 1950 as the State Office of Civil Defense. Then called the Governor's Office of Emergency Services, it coordinated overall State agency response to major disasters in support of local government. The EMA is responsible for assuring the State's readiness to respond to and recover from natural, human-made, and war-caused emergencies, and for assisting local governments in their emergency preparedness, response and recovery efforts.

The EMA serves as the central contact point in the State for any emergency or imminent disaster. It coordinates the notification of appropriate State administering agencies that may be required to respond, as well as the emergency activities of all State agencies in the event of an emergency. In doing so, the EMA does not focus on security specifically, but rather more broadly on addressing all potential incidents that could impact the State, such as earthquakes, fires, floods, and terrorist attacks. Furthermore, EMA coordinates with federal agencies, such as the DHS and FEMA, as well as other State and local agencies such as the CHP.

California's vision, mission, and principles for emergency management, as well as goals and objectives are located in its publication "Strategic Plan 2010-2015 – Keeping California Safe."[1]

Multi-Hazard Mitigation Plans. The goal of hazard mitigation plans is to guide implementation activities to achieve the greatest reduction of vulnerability, which will result in saved lives, reduced injuries, reduced property damages, and greater protection of the environment.

[1]California Emergency Management Agency, *Strategic Plan 2010-2015 – Keeping California Safe*, 2010.

FEMA now requires state and local governments to develop hazard mitigation plans. The DMA 2000, Section 322 (ad) requires that local governments, as a condition of receiving federal disaster mitigation funds, have a mitigation plan that describes the process for identifying hazards, risks and vulnerabilities; identifies and prioritizes mitigation actions; encourage the development of local mitigation; and provides technical support for those efforts. "Local Governments" are defined in the DMA 2000 to typically include counties, local municipalities, and tribal governments, but can also include other local agencies and organizations, including Councils of Governments, schools and other special districts.

California approved its State of California Multi-Hazard Mitigation Plan in 2010. The State is required to adopt a federally-approved State Multi-Hazard Mitigation Plan to be eligible for certain disaster assistance and mitigation funding. The Plan is an evaluation the hazards California faces and the strategies, goals, and activities the State will pursue to address these hazards. The Plan:[2]

- Documents Statewide hazard mitigation planning in California;
- Describes strategies and priorities for future mitigation activities;
- Facilitates the integration of local and tribal hazard mitigation planning activities into Statewide efforts;
- Meets State and federal statutory and regulatory requirements; and
- Is an annex to the State Emergency Plan.

All six SCAG counties and a number of cities within the SCAG region have completed Hazard Mitigation Plans. EMA dictates that these plans must be updated every three years.

County Offices of Emergency Services. Counties and cities are generally the first responders to any security or emergency situation. These responders include fire departments, police and sheriff department, hospitals, ambulance services and transportation agencies. Coordination among public and private agencies within various cities and counties make the most use of all available resources in the event of any emergency.

While each city and county has their own security procedures, the policies are generally similar. Mutual Aid agreements between cities, counties and private organizations help to maximize resources and reduce the human suffering associated with disaster situations. Each SCAG county has a department in charge of security and emergency response see **Table 3.12-1**.

TABLE 3.12-1: COUNTY OFFICES OF EMERGENCY SERVICES

County	Office Information	County	Office Information
Imperial	Office of Emergency Services 1078 Dogwood Road Heber, CA 92249 (760) 482-2400	Riverside	Office of Emergency Services 4080 Lemon Street, Suite 8 P.O. Box 1412 Riverside, CA 925021412 (951) 955-4700
Los Angeles	Office of Emergency Management 1275 N. Eastern Avenue Los Angeles, CA 90063 (323) 980-2261	San Bernardino	Office of Emergency Services 1743 W. Miro Way Rialto, CA 92376 (909) 356-3998
Orange	Office of Emergency Services 2644 Santiago Canyon Road Silverado, CA 92676 (714) 628-7055	Ventura	Office of Emergency Services Ventura County 800 South Victoria Avenue Ventura, CA 93009 (805) 654-2551

SOURCE: TAHA, 2011.

[2]California Emergency Management Agency, *Multi Hazard Mitigation Plan*, 2010.

Mutual Aid Agreements (MAA). Immediately following the 1994 Northridge earthquake, city and county emergency managers in the coastal, southern, and inland regions developed a coordinated emergency management concept called the Emergency Managers Mutual Aid (EMMA) system. EMMA provided a valuable service in the emergency response and recovery efforts at the Southern Regional Emergency Operations Center (REOC), local Emergency Operations Centers (EOCs), the Disaster Field Office (DFO), and community service centers.

The purpose of EMMA is to support disaster operations in affected jurisdictions by providing professional emergency management personnel. In accordance with the Master Mutual Aid Agreement, local and State emergency managers have responded in support of each other under a variety of plans and procedures.

The objectives of the EMMA Plan include:[3]

- Providing emergency management personnel from unaffected areas to support local jurisdictions, Operational Areas, and regional emergency operations during proclaimed emergencies;
- Providing a system, including an organization, information, and forms necessary to coordinate the formal request, reception, assignment, and training of assigned personnel;
- Establishing a structure to maintain this document (the Emergency Managers Mutual Aid Plan) and its procedures;
- Providing for the coordination of training for emergency managers, including Standardized Emergency Management System (SEMS/NIMS) training, emergency management course work, exercises, and disaster response procedures; and
- Promoting professionalism in emergency management.

METRANS Transportation Center. The METRANS Transportation Center, which is a joint partnership between the University of Southern California and California State University, Long Beach, is a U.S. Department of Transportation University Transportation Center that was established in 1998 under the Transportation Equity Act for the 21st Century. The mission of METRANS is to 'solve transportation problems of large metropolitan regions through interdisciplinary research, education and outreach'. In doing so, METRANS conducts research in several areas relating to transportation, including safety, security, and vulnerability. Specifically, this study attempts to analyze safety and security issues, such as pedestrian and transit safety, vulnerability of major infrastructure, and safety and risk mitigation.

Intelligent Transportation System (ITS). One way to incorporate safety and security into transportation planning is through greater collaboration between transportation planning and operations. Collaboration is particularly critical in metropolitan regions and congested corridors where numerous jurisdictions, agencies, and service providers are responsible for the safety, security, and efficient operation of various aspects of the transportation system. Not only are the roadway and transit system operators themselves dependent on the transportation system, but so are police, fire, and medical services, emergency response and domestic security systems, and port authorities.

Collaboration enables regional strategic development of projects and policies that have regional effects on users, including activities, such as incident management, advanced traveler information services, public safety/EMS/security, special events, electronic payment services, and performance measures.

ITS are one method of establishing a collaborative relationship. ITS projects were originally designed to increase transportation efficiency. It was recognized early on that ITS investments may also serve to enhance the safety, security and emergency response capabilities of the region. Such systems may be of assistance in the detection, response and recovery to human-made and natural disasters.

[3]California Emergency Management Agency, *Emergency Managers Mutual Aid Plan*, November 1997.

Because the successful operation of ITS projects usually depend on coordination and communication between different agencies and the systems they operate, it is essential that there be a region-wide framework for cooperation to help achieve that coordination and communication in the most cost-effective manner. This framework is referred to as the Southern California Regional ITS Architecture.

Southern California Regional ITS Architecture. The Southern California ITS Regional Architecture includes all six counties in the SCAG region. The goal of the project is to document the ITS Architecture covering the region. An ITS Architecture is a framework for ensuring institutional agreement and technical integration of technologies for the implementation of projects or groups of projects under an ITS strategy. Local components to the ITS Architecture exist for Los Angeles County, Orange County, Inland Empire, Ventura County, and Imperial County.

California Critical Needs Assessments. There have also been several assessments of the critical State transportation infrastructure, which include identification of the key transportation facilities. Assessments have been conducted by the following bodies:

- The Governor's Office of Emergency Services
- The California Attorney General's Office

CHP conducted a vulnerability assessment of the State's highway system and has issued a confidential report to the State Legislature

The results of these assessments have been shared with the transportation system operators and incorporated into their security planning. However, security considerations have precluded the inclusion or discussion of these critical system elements in public documents.

Strategic Highway Network (STRAHNET). The STRAHNET routes within the SCAG region are essential to readily accommodate the movement of military supplies and personnel in times of national emergency. STRAHNET routes were selected by the federal government, and include the National Interstate system, as well as key "non-interstate" routes and connectors to ports and military installations.

Within the SCAG region, all interstates are part of the STRAHNET. SR-14, SR-101 and Route 395 are part of the non-interstate STRAHNET routes. Various connectors between the ports, as well as various military installations and STRAHNET are also included. A visual representation of the STRAHNET within the SCAG region is displayed in **Map 2.0-1** located in Chapter 8.0 (Maps).

Local

Congestion Management Programs (CMPs). In order to meet federal certification requirements, SCAG and the county Congestion Management Agencies (CMAs) have worked together to develop a congestion management process for the region. In the SCAG region, the Congestion Management System (CMS) is comprised of the combined activities of the RTP/SCS, the CMP and the Regional Transportation Improvement Program (RTIP).

Under California law, CMPs are prepared and maintained by the CMAs. The Los Angeles County Metropolitan Transportation Authority (Metro), Orange County Transportation Authority (OCTA), Riverside County Transportation Commission (RCTC), San Bernardino Associated Governments (SANBAG), and Ventura County Transportation Commission (VCTC) are the designated CMAs of each county and are subject to State requirements. While Imperial County is not subject to State CMP requirements, CMP-related activities there are accomplished through the development of the RTP/SCS and the RTIP by the Imperial County Transportation Commission (ICTC).

In addition to SCAG's RTP/SCS and RTIP, the key elements of the federal Congestion Management Process are addressed through the counties CMPs. Because the magnitude of congestion and degree of urbanization differ among the counties, each CMP differs in form and local procedure. By State law, all CMPs perform the monitoring and management functions shown below which also fulfill the federal CMP requirements.

- Highway Performance – Each CMA monitors the performance of an identified highway system. This monitoring allows each county to track how their system, and its individual components, is performing against established standards, and how performance changes over time.
- Multi-Modal Performance – In addition to highway performance, each CMP contains an element to evaluate the performance of other transportation modes including transit.
- Transportation Demand Management (TDM) – Each CMP contains a TDM component geared at reducing travel demand and promoting alternative transportation methods.
- Land Use Programs and Analysis – Each CMP incorporates a program for analyzing the effects of local land use decisions on the regional transportation system.
- Capital Improvement Program (CIP) – Using data and performance measures developed through the activities identified above, each CMP develops a CIP. This becomes the first step in developing the County Transportation Improvement Program (TIP). Under State law, projects funded through the RTIP must first be contained in the county CIP.
- Deficiency Planning – The CMP contains provisions for "deficiency plans" to address unacceptable levels of congestion. Deficiency plans can be developed for specific problem areas or on a system-wide basis. Projects implemented through the deficiency plans must, by statute, have both mobility and air quality benefits. In many cases, the deficiency plans capture the benefits of transportation improvements that occur outside the county TIPs and RTIP such as non-traditional strategies and/or non-regionally significant projects.

The regional transportation planning process and the county congestion management process should be compatible with one another. To ensure consistency, SCAG and the CMAs have developed the Regional Consistency and Compatibility Criteria for CMPs. Information on the CMP activities and resulting data is updated on a biennial basis by each CMA and supplied to SCAG and air quality management districts.

EXISTING SETTING

The Southern California transportation system is a complex intermodal network designed to carry both people and goods. It consists of roads and highways, public transit, paratransit, bus, rail, airports, seaports and intermodal terminals. The regional highway system consists of an interconnected network of local streets, arterial streets, freeways, carpool lanes and toll roads. This highway network allows for the operation of private autos, carpools, private and public buses, and trucks. Active transportation modes, such as bicycles and pedestrians share many of these facilities. The regional public transit system includes local shuttles, municipal and area-wide public bus operations, rail transit operations, regional commuter rail services, and inter-regional passenger rail service. The freight railroad network includes an extensive system of private railroads and several publicly owned freight rail lines serving industrial cargo and goods. The airport system consists of commercial, general, and military aviation facilities serving passenger, freight, business, recreational, and defense needs. The region's seaports support substantial international and interregional freight movement and tourist travel. Intermodal terminals consisting of freight processing facilities, which transfer, store, and distribute goods. The transportation system supports the region's economic needs, as well as the demand for personal travel.

Transit use is growing in the SCAG region. As of 2009, transit agencies in the SCAG Region reported 747.3 million boardings. This represents growth of nearly 20 percent in the ten years between 2000 and

2010, but only 4 percent growth in per capita trips due to population growth. Metrolink and Metro Rail (Los Angeles County) have seen ridership growth of 6 to 8 percent a year.

Transportation Planning in the SCAG Region

Numerous agencies are responsible for transportation planning and investment decisions within the SCAG region. SCAG helps integrate the transportation-planning activities in the region to ensure a balanced, multi-modal plan that meets regional as well as county, subregional, and local goals.

Table 3.12-2 identifies local, state and federal governmental agencies that participated in the development of the 2012-2035 RTP/SCS. Seven major entities and agencies are involved including SCAG as the designated Metropolitan Planning Organization (MPO), the County Transportation Commissions (CTCs), Sub-regional Councils of Governments (COG), local and county governments, transit and transportation owners, operators and implementing agencies, resource/regulating agencies and other private non-profit organizations, interest groups and tribal nations.

TABLE 3.12-2: STAKEHOLDERS IN THE DEVELOPMENT OF THE PLAN

COUNTY TRANSPORTATION COMMISSIONS	
Imperial County Transportation Commission (ICTC)	Riverside County Transportation Commission (RCTC)
Los Angeles County Metropolitan Transportation Authority (Metro)	San Bernardino Associated Governments (SANBAG)
Orange County Transportation Authority (OCTA)	Ventura County Transportation Commission (VCTC)
SUBREGIONAL COUNCILS OF GOVERNMENTS	
Arroyo Verdugo Cities	SANBAG
Coachella Valley Association of Governments	San Fernando Valley COG
Gateway Cities Council of Governments (COG)	San Gabriel Valley COG
ICTC	South Bay Cities COG
Las Virgenes-Malibu-Conejo COG	Ventura County COG
City of Los Angeles	Western Riverside County COG
North Los Angeles County	Westside Cities COG
Orange County COG	
LOCAL, COUNTY, AND TRIBAL GOVERNMENTS	
OTHER OPERATORS AND IMPLEMENTING AGENCIES	
Caltrans	Transportation Corridor Agencies (TCA)
Airport Authorities	Transit / Rail Operators
Port Authorities	
RESOURCE/REGULATING AGENCIES	
US Department of Transportation • Federal Highway Administration (FHWA) • Federal Transit Administration (FTA) • Federal Aviation Administration (FAA) • Federal Railroad Administration (FRA)	U.S. Environmental Protection Agency (USEPA) California Air Resources Board (ARB) California Environmental Protection Agency (Cal/EPA) Air Districts
SOURCE: SCAG, 2012-2035 RTP/SCS Page 33, Table 8, 2011	

Each of the six counties in the SCAG region has a Transportation Commission or Authority. These agencies are charged with countywide transportation planning activities, allocation of locally generated transportation revenues and, in some cases, operation of transit services. In addition, there are 14 subregional COGs within the SCAG region which are groups of cities and communities geographically clustered (sometimes comprising an entire county), which work together to identify, prioritize, and seek transportation funding for needed investments in their respective areas.

Circulation System

Commute Patterns and Travel Characteristics

The existing transportation network serving the SCAG region supports the movement of people and goods. On a typical weekday in the six-county region, the transportation network supports a total of approximately 448 million vehicle miles of travel (VMT) and 13 million vehicle hours of travel (VHT). Of this total, over half occur in Los Angeles County and less in Orange County, San Bernardino County, Riverside County, Ventura County and Imperial County, respectively. A detailed summary of existing VMT and VHT for the region and six counties is presented in **Table 3.12-3**.

Much of the existing travel in the SCAG region takes place during periods of congestion, particularly during the morning (6:00 a.m. to 9:00 a.m.) and evening peak periods (3:00 p.m. to 7:00 p.m.). Congestion can be quantified as the amount of travel that takes place in delay (vehicle hours of delay or VHD) and, alternately, as the percentage of all travel time that occurs in delay (defined as the travel time spent on the highway due to congestion, which is the difference between VHT at free-flow speeds and VHT at congested speeds). **Table 3.12-4** presents the existing travel delays and percent of regional VHT in delay by County on freeways and arterials. As shown in **Table 3.12-4**, regional travel time in delay represents approximately 25 percent of all daily, 30 percent of all AM peak period, and 38 percent of all PM peak period travel times.

The average vehicle home-to-work trip duration in each county is generally similar while a greater range of average work distances is found in the different counties of the region (from a low of ten miles in Imperial County to a high of 18 miles in San Bernardino and Riverside Counties). Home-to-work trip duration and distance are both greater for the inland counties of Riverside and San Bernardino, reflecting regional housing and employment distribution patterns.

Map 3.12-1 located in Chapter 8.0 (Maps), shows AM peak period congestion delay on the regional freeway system. Major portions of the system are extremely congested during the AM peak period, particularly in Los Angeles and Orange Counties and the areas immediately to the east and west. A substantial portion of AM peak period travel in each county takes place in delay, ranging from a low of three percent in Imperial County to a high of 33 percent in Los Angeles County, as indicated in **Table 3.12-4**.

Map 3.12-2 located in Chapter 8.0 (Maps), shows PM peak period congestion delay on the regional freeway system. Major portions of the system are extremely congested during the PM peak period, particularly in Los Angeles and Orange Counties and the areas immediately to the east and west. A substantial portion of PM peak period travel in each county takes place in delay, ranging from a low of four percent in Imperial County to a high of 43 percent in Los Angeles County, as indicated in **Table 3.12-4**.

TABLE 3.12-3: SUMMARY OF EXISTING DAILY VEHICLE MILES & PERCENT VEHICLE HOURS OF TRAVEL

	Vehicle Miles of Travel (VMT)						Vehicle Hours of Travel (VHT)					
	AM Peak Period		PM Peak Period		Daily		AM Peak Period		PM Peak Period		Daily	
County	Miles	% of Region	Miles	% of Region	Miles	% of Region	Hours	% of Region	Hours	% of Region	Hours	% of Region
Imperial	1,087,000	1%	1,643,000	1%	6,136,000	1%	22,000	1%	34,000	1%	123,000	1%
Los Angeles	46,321,000	51%	74,635,000	51%	224,312,000	50%	1,627,000	57%	3,181,000	59%	7,428,000	56%
Orange	15,589,000	17%	24,793,000	17%	75,224,000	17%	474,000	16%	879,000	16%	2,171,000	17%
Riverside	12,099,000	13%	18,817,000	13%	60,494,000	14%	320,000	11%	542,000	10%	1,469,000	11%
San Bernardino	12,242,000	13%	18,944,000	13%	61,010,000	14%	307,000	11%	512,000	10%	1,416,000	11%
Ventura	4,340,000	5%	6,929,000	5%	20,722,000	5%	121,000	4%	217,000	4%	548,000	4%
Total	**91,678,000**	**100%**	**145,761,000**	**100%**	**447,898,000**	**100%**	**2,871,000**	**100%**	**5,365,000**	**100%**	**13,155,000**	**100%**

SOURCE: SCAG 2012-2035 RTP/SCS, Highways and Arterials Appendix, Page 52, Table A12, 2011.

TABLE 3.12-4: SUMMARY OF EXISTING DELAY AND WORK TRIP LENGTH

	Vehicle Hours of Delay			% of Travel in Delay			Average Home-to-Work Trip Distance (miles)	Average Home-to-Work Trip Duration (minutes)	
County	AM Peak Period	PM Peak Period	Daily	AM Peak Period	PM Peak Period	Daily	Vehicle Trips (AM Only)	Vehicle Trips (AM Only)	Transit Trips (AM only)
Imperial	1,000	1,000	5,000	3%	4%	4%	10	13	66
Los Angeles	554,000	1,387,000	2,204,000	34%	44%	30%	14	26	69
Orange	128,000	313,000	493,000	27%	36%	23%	13	21	78
Riverside	78,000	158,000	263,000	24%	29%	18%	18	29	95
San Bernardino	64,000	125,000	205,000	21%	24%	14%	18	29	116
Ventura	29,000	68,000	107,000	24%	32%	19%	16	27	109
Total	**854,000**	**2,052,000**	**3,277,000**	**30%**	**38%**	**25%**	**15**	**26**	**73**

SOURCE: SCAG, 2012-2035 RTP/SCS, Highways and Arterials Appendix, Page 52, Table A12, 2011.

Based on average accident rates provided by Caltrans, transportation-related fatalities occur at an overall rate of 0.83 fatalities per 100 million vehicle miles traveled, taking into account the varying accident rates on different facility types (freeway, arterials) and travel modes (bus transit, rail transit). These specific accident rates and the resulting estimate of region-wide accidents are detailed in **Table 3.12-5**.

TABLE 3.12-5: TOTAL VEHICLE FATALITIES

County	Fatalities (2009)	Fatalities per 100 million Vehicle Miles Traveled	Annual Vehicle Miles Traveled per100 million
Imperial	37	1.76	21
Los Angeles	589	0.76	778
Orange	154	0.59	261
Riverside	219	1.04	210
San Bernardino	236	1.11	212
Ventura	62	0.86	72
Total	**1,297**	**0.83**	**1,554**

SOURCE: SCAG, 2011.

A summary of home-to-work trip characteristics by county is also presented in **Table 3.12-6**. Public transit in all forms (including school buses) carries approximately 2.4 percent of all trips in the SCAG region. Of these, the greatest number of travelers is carried by buses, with lesser patronage on Metro Rail, paratransit, commuter rail and other forms of public transit services. Work trips made via public transit account for 6.1 percent of all home-to-work trips in the region, as detailed in **Table 3.12-6**.

TABLE 3.12-6: EXISTING TRAVEL MODE SPLIT (% OF COUNTY TOTAL)

County	Person Trip Type	Drive Alone	2 Person Carpool	3 Person Carpool	Auto Passenger Trip	Transit	Non-Motorized	Total
Imperial	Home-Work/Univ	75%	3.9%	1.5%	7.6%	1.4%	10%	100%
	All Daily Trips	41%	7.4%	5.4%	20%	0.54%	25%	100%
Los Angeles	Home-Work/Univ	76%	3.4%	1.5%	7.1%	9.1%	3.0%	100%
	All Daily Trips	43%	8.0%	6.5%	24%	3.5%	14%	100%
Orange	Home-Work/Univ	81%	3.7%	1.5%	7.4%	3.4%	3.0%	100%
	All Daily Trips	46%	8.3%	6.8%	26%	1.4%	12%	100%
Riverside	Home-Work/Univ	82%	3.7%	1.8%	8.0%	1.5%	3.1%	100%
	All Daily Trips	42%	8.3%	7.3%	27%	0.72%	15%	100%
San Bernardino	Home-Work/Univ	82%	3.8%	1.8%	8.3%	1.4%	3.0%	100%
	All Daily Trips	43%	8.4%	7.3%	27%	0.58%	14%	100%
Ventura	Home-Work/Univ	82%	3.2%	1.4%	6.6%	2.7%	3.7%	100%
	All Daily Trips	43%	7.5%	6.3%	23%	1.1%	19%	100%
Total	**Home-Work/Univ**	**78%**	**3.5%**	**1.6%**	**7.3%**	**6.1%**	**3.1%**	**100%**
	All Daily Trips	**43%**	**8.1%**	**6.7%**	**25%**	**2.4%**	**14%**	**100%**

SOURCE: SCAG Transportation Modeling 2011.

Regional Freeway, Highway, and Arterial System

The regional freeway and highway system shown in **Map 3.12-3** located in Chapter 8.0 (Maps), is the primary means of person and freight movement for the region. This system provides for direct auto, bus and truck access to employment, services and goods. The network of freeways and State highways serves as the backbone of the system offering very high capacity limited-access travel and serving as the primary heavy-duty truck route system. The components of the regional highway and freeway system are included in **Table 3.12-7**.

TABLE 3.12-7: EXISTING REGIONAL FREEWAY ROUTE MILES AND LANE MILES BY COUNTY		
County	**Freeway Route Miles**	**Freeway Lane Miles**
Imperial	95	379
Los Angeles	637	4,583
Orange	167	1,294
Riverside	309	1,722
San Bernardino	471	2,512
Ventura	93	532
Total	**1,772**	**9,424**
SOURCE: SCAG Transportation Modeling 2011.		

Regional High Occupancy-Vehicle (HOV) System and Park & Ride System

The regional HOV system consists of exclusive lanes on freeways and arterials, as well as busways and exclusive rights-of-way dedicated to the use of high-occupant vehicles (HOVs). It includes lanes on freeways, ramps and freeway-to-freeway connectors. The regional HOV system is designed to maximize the person-carrying capacity of the freeway system through the encouragement of shared-ride travel modes. HOV lanes operate at a minimum occupancy threshold of either two or three persons. Many include on-line and off-line park and ride facilities, and several HOV lanes are full "transitways" including on-line and off-line stations for buses to board passengers. The current system is described in **Table 3.12-8**.

TABLE 3.12-8: EXISTING REGIONAL HIGH OCCUPANCY VEHICLE LANE MILES BY COUNTY	
County	**HOV Total Lane Miles**
Imperial	0
Los Angeles	479
Orange	241
Riverside	83
San Bernardino	105
Ventura	0
Total	**908**
SOURCE: SCAG Transportation Modeling 2011.	

Park and ride facilities are generally located at the urban fringe along heavily-traveled freeway and transit corridors and support shared-ride trips, either by transit, by carpool or vanpool. Most rail transit stations have park and ride lots nearby. There are currently 189 park and ride lots in the SCAG region, including Metrolink station parking lots. These facilities include: 106 in Los Angeles County, 20 park and ride facilities in Orange County, 25 in Riverside County, 17 in San Bernardino County and 21 in Ventura County.[4]

Arterial Street System

The local street system provides access for local businesses and residents. Arterials account for over 80 percent of the total road network and carry a high percentage of total traffic. In many cases arterials serve as alternate parallel routes to congested freeway corridors. Peak period congestion on the arterial street system occurs generally in the vicinity of activity centers, at bottleneck intersections and near many freeway interchanges. The region's arterial street system is described in terms of number of miles in **Table 3.12-9**.

[4]Riverside County Transportation Commission and the San Bernardino Associated Governments, IE511.org, 2011.

TABLE 3.12-9: EXISTING REGIONAL ARTERIAL ROUTE MILES AND LANE MILES BY COUNTY

County	Arterials	Lane Miles
Imperial	Principal	433
	Minor	697
Los Angeles	Principal	8,848
	Minor	9,076
Orange	Principal	3,242
	Minor	3,147
Riverside	Principal	1,181
	Minor	3,235
San Bernardino	Principal	1,934
	Minor	4,365
Ventura	Principal	908
	Minor	986
SCAG Total	**Principal**	**16,547**
	Minor	**21,506**

SOURCE: SCAG Transportation Modeling 2011.

Goods Movement

Wholesale and retail trade, transportation, and manufacturing support over 3.3 million jobs in the region according to statistics provided by the State's Employment Development Department. Goods movement includes trucking, rail freight, air cargo, marine cargo, and both domestic and international freight, the latter entering the country via the seaports, airports, and the international border with Mexico. Additionally, many cargo movements are intermodal, e.g. sea to truck, sea to rail, air to truck, or truck to rail. The goods movement system includes not only highways, railroads, sea lanes, and airways, but also intermodal terminals, truck terminals, railyards, warehousing, freight consolidation/de-consolidation terminals, freight forwarding, package express, customs inspection stations, truck stops, and truck queuing areas.

Railroads

The SCAG region is served by two main line commercial freight railroads - the Burlington Northern/Santa Fe Railway Co. (BNSF) and the Union Pacific Railroad (UP). These railroads link Southern California with other United States regions, Mexico and Canada either directly or via their connections with other railroads. They also provide freight rail service within California. In 2011, railroads moved approximately 150 million tons of cargo throughout California.

The SCAG region is also served by three short line or switching railroads:

- The Pacific Harbor Line (formerly the Harbor Belt Railroad), which handles all rail coordination involving the Ports of Los Angeles and Long Beach, including dispatching and local switching in the harbor area
- Los Angeles Junction Railway Company, owned by BNSF, which provides switching service in the Vernon area for both the BNSF and UP
- The Ventura County Railroad, owned by Rail America, Inc., which serves the Port of Hueneme and connects with the UP in Oxnard

These railroads perform specific local functions and serve as feeder lines to the trunk line railroads for moving goods to and from Southern California.

The two main line railroads also maintain and serve major facilities in the SCAG region. Intermodal facilities in Commerce (BNSF-Hobart), East Los Angeles (UP), San Bernardino (BNSF), and Carson near the San Pedro Bay Ports (UP-ICTF), the Los Angeles Transportation Center (UP-LATC), and the UP-City of Industry yards serve on-dock rail capacity at the Ports of Los Angeles (UP/BNSF) and Long Beach (UP/BNSF).

All of the major rail freight corridors in the region have some degree of grade separation, but most still have a substantial number of at-grade crossings on major streets with high volumes of vehicular traffic. These crossings cause both safety and reliability problems for the railroads and for those in motor vehicles at the affected crossings. Trespassing on railroad rights of way by pedestrians is another safety issue affecting both freight and commuter railroads.

As an example, the Colton Crossing, is an at-grade railroad crossing located south of I-10 between Rancho Avenue and Mount Vernon Avenue in the City of Colton, where BNSF's San Bernardino Line crosses UP's Alhambra/Yuma Lines. In 2008, the Colton Crossing saw on average 110 freight trains per day.[5]

Another key component of the regional rail network is the Alameda Corridor, a 20-mile, four-lane freight rail expressway that began operations in April 2002. In 2010, approximately 14,177 intermodal trains transited the Alameda Corridor, an approximate increase of 8.6 percent since 2009.[6]

Heavy-Duty Trucks

One of the key components of the region's goods movement system is the fleet of heavy-duty trucks, defined as cargo-carrying vehicles with a gross weight rating in excess of 8,500 pounds. Trucks provide a vital link in the distribution of all types of goods between the region's ports (sea and air), railroads, warehouses, factories, farms, construction sites and stores. The size and weight of heavy-duty trucks gives them unique operating characteristics; i.e., they accelerate and decelerate more slowly than lighter vehicles and require more road space to maneuver. Dedicated truck lanes currently exist at two major freeway interchanges: the junction of I-5 with the I-210 and the SR-14 and at the junction of the I-405 with the I-110. In addition, truck climbing lanes are located on northbound I-5 in northern Los Angeles County.

The trucking industry, including common carrier, private carrier, contract carrier, drayage and owner-operator services, handles both line-haul and pick-up and delivery. The industry uses the public highway system for over-the-road and local service. However, it is also served by a considerable infrastructure of its own. This infrastructure includes truck terminals, warehousing, consolidation and trans-loading facilities, freight forwarders, truck stops and maintenance facilities. These various facilities are especially prevalent in the case in the South Bay and Gateway Cities areas, including Wilmington and Carson and extending generally between LAX and the San Pedro Bay Ports, along the I-710 Corridor north to Vernon, Commerce, and downtown Los Angeles, east through the San Gabriel Valley to Industry, Pomona, and Ontario and then to the Inland Empire in Fontana and Rialto as well as in Glendale, Burbank and Bakersfield. Specialized facilities for trucking that provide air cargo ground transport are located around regional airport facilities, notably LAX and LA/Ontario International Airport.

Maritime Ports

Southern California is served by three major deep-water seaports. These ports—Hueneme, Long Beach and Los Angeles—handle Asia – North America trade, and are served by the two major railroads and numerous trucking companies in Southern California. The Port of Hueneme, with its recent expansion, ranks as one of

[5]SANBAG, 2011. Colton Crossing Project. http://www.coltoncrossing.com/EnvironmentalAndEngineeringDocuments/Colton%20Crossing_Final%20EA%20and%20FONSI_2011-05.pdf, accessed September 2011.

[6]Alameda Corridor Transportation Authority, Number of Trains Running on the Alameda Corridor (http://www.acta.org/pdf/CorridorTrainCounts.pdf), 2011.

the premier automobile and agricultural product-handling facilities in California. The Ports of Long Beach and Los Angeles are full-service ports with facilities for containers, autos and various bulk cargoes. With an extensive landside transportation network, the three ports moved more than 310 million metric tons of cargo in 2010.[7]

In particular, the San Pedro Bay Ports (Long Beach and Los Angeles) dominate the container trade in the Americas by shipping and receiving more than 11.8 million twenty-foot Equivalent Units (TEUs) of containers in 2009.[8] Together these two ports rank third in the world, behind Rotterdam and Hong Kong, as the busiest maritime ports.

Regional Aviation System

The SCAG region contains 56 public use airports, including six active commercial service airports, 44 general aviation, two active limited-commercial service (commuter) airports, two former military airfields (now public-use airports) and two joint-use facilities. The existing active commercial service airports (shown on **Map 3.12-4** located in Chapter 8.0 (Maps)) handle the majority of passenger air traffic. They are:

- Los Angeles International Airport
- LA/Ontario International Airport
- John Wayne/Orange County Airport
- Bob Hope Airport
- Imperial County Airport (limited commercial service)
- Long Beach Airport
- Palm Springs International Airport
- Oxnard (limited commercial service)

In all, some 81 million annual passengers (MAP) were served in the region in 2010, more than double the number served in 1980. The level of air passenger demand is forecast to be approximately 146 MAP by 2035. While none of the individual airports is the largest in the U.S., the region's airports collectively are the busiest of any region in the country. The existing level of activity reflecting air passenger demand (MAP), operations (take-offs and landings or TOAL) and air cargo demand at each of the six existing airports is shown in **Table 3.12-10**. A brief discussion of the location, major access routes and facilities at each of these airports follows. In addition, the six other regional airports at which major improvements and/or conversion to civilian uses are contemplated are also described below.

TABLE 3.12-10: EXISTING (2010) ACTIVITY AT MAJOR COMMERCIAL AIRPORTS IN THE SCAG REGION

	Burbank	John Wayne	Long Beach	Los Angeles	LA/ Ontario	Palm Springs	Regional Total
Passenger Volume (1,000)	4,461	8,663	2,978	59,069	4,808	1,420	81,399
Percent of Regional Total	5.5%	10.6%	3.7%	72.6%	5.9%	1.7%	100%
Cargo Volume (tons)	48,084	14,920	28,690	1,926,825	392,427	<100	2,410,946
Percent of Regional Total	2.0%	0.6%	1.2%	79.9%	16.3%	0.0%	100%
Annual Operations	112,658	200,278	315,340	575,835	98,332*	64,490	1,366,933
Average Daily Operations	309	549	864	1,578	269*	177	3,745
Percent of Regional Total	8.2%	14.7%	23.1%	42.1%	7.2%	4.7%	100%

Note: Ontario data is from 2009 statistics.
SOURCE: SCAG, 2011

[7]Port of Los Angeles 2010 Financial Statement; Port of Los Angeles 2010 Tonnage Statistics; and Port of Long Beach December 2010 Monthly Tonnage Summary Report.

[8]SCAG. *Port Activity and Competitiveness Tracker (PACT)*, 2011.

Los Angeles International Airport

Los Angeles International Airport (LAX), as shown in **Map 3.12-4** located in Chapter 8.0 (Maps), is located in the southwestern portion of the City of Los Angeles, bordered by Arbor Vitae / Westchester Parkway to the north, I-405 to the east, I-105 / Imperial Highway to the south, and the Pacific Ocean to the west. It is surrounded by the communities of Westchester and Playa del Rey to the north; the City of El Segundo to the south; and the City of Inglewood and unincorporated areas of Los Angeles County (Lennox and Del Aire) to the east. Major access routes include I-405 and I-105 and a complex network of surface streets extending throughout the surrounding area, including Sepulveda Boulevard, Lincoln Boulevard, La Cienega Boulevard, Aviation Boulevard, Century Boulevard, Arbor Vitae / Westchester Parkway and Imperial Highway.

LA/Ontario International Airport

LA/Ontario International Airport (ONT) is located in the southwest section of San Bernardino County within the city of Ontario, approximately two miles east of Ontario's Central Business District between Holt and Mission Boulevards, and between Haven and Grove Avenues, as shown in **Map 3.12-4** located in Chapter 8.0 (Maps). Major access routes include I-10 and SR-60 and the major surface streets in the surrounding area, including Holt Boulevard, Archibald and Vineyard Avenues.

John Wayne Airport

John Wayne Airport (SNA) is located in the western portion of Orange County, directly south of I-405, one mile east of SR-55, and one mile north of SR-73, as shown in **Map 3.12-4** located in Chapter 8.0 (Maps). Major access routes include these freeways and the major surface streets in the surrounding area, including MacArthur Boulevard and Michelson Drive. The majority of the land surrounding the Airport is within the cities of Newport Beach, Costa Mesa, and Irvine. In addition, the unincorporated community of Santa Ana Heights is located southeast of the Airport.

Bob Hope Airport

Bob Hope Airport (BUR) is located in the western portion of Los Angeles County, on the west side of the City of Burbank, one mile south of I-5, three miles east of SR-170, and three miles north of SR-134, as shown in **Map 3.12-4** located in Chapter 8.0 (Maps). Major access routes include these freeways and the major surface streets in the surrounding area, including Hollywood Way and San Fernando Road.

Long Beach Airport

Long Beach Airport (LGB) is located in the southern portion of Los Angeles County, in the center of the City of Long Beach, directly north of I-405, and three miles west of I-605, and three miles east of I-710, as shown in **Map 3.12-4** located in Chapter 8.0 (Maps). Major access routes include these freeways and the major surface streets in the surrounding area, including Lakewood Boulevard (SR 19).

Palm Springs International Airport

Palm Springs International Airport (PSP) is located in the central portion of Riverside County, in the City of Palm Springs, two miles southwest of I-10 and one mile northeast of Gene Autry Trail (SR-111), as shown in **Map 3.12-4** located in Chapter 8.0 (Maps). Major access routes include these highways and the major surface streets in the surrounding area, including Ramon Road.

Palmdale Regional Airport

Palmdale Regional Airport (PMD) is located in northern Los Angeles County, within the north central portion of the City of Palmdale in United States Air Force Plant 42 (AFP 42), one mile north of SR-138, and

three miles east of SR-14, as shown in **Map 3.12-4** located in Chapter 8.0 (Maps). Major access routes include these highways and the major surface streets in the surrounding area, including 20th Street and Avenue P.

San Bernardino International Airport

San Bernardino Airport (SBD), formerly Norton Air Force Base, is within the City of San Bernardino and is surrounded by unincorporated areas of San Bernardino County and the cities of Redlands, Loma Linda, Highland, and Colton. The Airport is approximately three miles east of I-215, two miles north of I-10, and one mile west and two miles south of SR 30, as shown in **Map 3.12-4** located in Chapter 8.0 (Maps). Major access routes include these highways and the major surface streets in the surrounding area, including Tippecanoe Avenue, Mill Street and 3rd Street.

Southern California Logistics Airport

Southern California Logistics Airport (VCV), formerly George Air Force Base, is within the City of Victorville, surrounded by unincorporated areas of San Bernardino County and the cities of Victorville and Adelanto. It is approximately two miles east of Route 395, and three miles northwest of I-15, as shown in **Map 3.12-4** located in Chapter 8.0 (Maps). Major access routes include these highways and the major surface streets in the surrounding area, including Adelanto Road and Air Base Road.

March Air Reserve Base/March Inland Port

March Air Reserve Base / March Inland Port (March), formerly March Air Force Base, is located in the western portion of Riverside County east of and adjacent to I-215 and two miles south of SR-60, as shown in **Map 3.12-4** located in Chapter 8.0 (Maps). The joint-use facility is bordered by the cities of Moreno Valley to the north and east, Riverside to the northwest, and Perris to the south. Major access routes include these freeways and the major surface streets in the surrounding area, including Van Buren Boulevard and Perris Boulevard.

Security and Emergency Access

Southern California is home to significant natural disasters; including earthquakes, wildfires, flooding and mudslides (discussed in Section 3.5 Geology and Soils, of this PEIR). Although natural disasters, such as earthquakes and hurricanes, have produced significant regional casualties and property damage, none had the serious disruption to national travel and the national economy as the September 11th, 2001 terrorist attacks. The September 11th attacks created a new awareness of the vulnerabilities of transportation fleets and facilities. As concern about the threat of terrorism and consequences of natural disasters has grown, government (at all levels) has taken new measures to secure the welfare of its citizens. Transportation and transit agencies throughout the United States are taking increasing steps to protect their facilities against the threats of crime, terrorist activity, and natural disasters.

A large scale evacuation would be difficult in the SCAG region. The region already has severe traffic congestion and mobility issues. The region encompasses 38,000 square miles with a diverse geography, ranging from dense urban areas, to mountain ranges, to vast deserts. The interdependency of the jurisdictions and organizations makes regional cooperation and coordination essential to security and emergency preparedness. Typically, no single agency is responsible for transportation security. At the local level, especially within transit agencies, safety may be handled within one office. However, it is far less likely that the security of a surface transportation mode is managed by one entity and that this entity is even controlled by the transportation organization. For example, highways and transit networks traverse multiple police jurisdictions, local fire departments generally fill the incident command role after terrorist events, regional

command and control centers respond to both natural and intentional disasters, and federal agencies intervene as needed and based on specific guidelines such as the crossing of state boundaries.[9]

The complexity of the SCAG region, with a range of potential terrorism targets, presents significant challenges in coordinating and implementing effective homeland security programs. The unexpected and complex nature of these natural and human-caused incidents require extensive coordination, collaboration and flexibility among all of the agencies and organizations involved in planning, mitigation, response and recovery.

Safety is defined as the protection of persons and property from unintentional damage or destruction caused by accidental or natural events.

Security is defined as the protection of persons or property from intentional damage or destruction caused by vandalism, criminal activity or terrorist attacks. The Transportation Research Board has classified emergency events that affect transportation agencies into several categories, which are illustrated below in **Table 3.12-11**.[10]

TABLE 3.12-11: TRANSPORTATION SECURITY VULNERABILITIES

ROADWAYS AND FREEWAY	
Freeway Lanes Miles (excluding carpool)	9,424 miles
Carpool Lane Miles	1,033 miles
Road Lane Miles	38,871 miles
PUBLIC TRANSIT	
Buses	5,443 vehicles
Metro Rail	73 miles and 65 stations
Metrolink	512 miles and 55 stations
AVIATION/PORTS	
Commercial/General Aviation Airports	57
LAX rank among world's airports	6 in passengers and
	11 in air cargo tonnage
Long Beach/Los Angeles rank among world container ports	5th
Share of United States Maritime Trade	41 percent

SOURCE: SCAG 2012-2035 RTP/SCS, Transportation Security Appendix, Page 3, 2011.

International Border Crossings. Within the SCAG region, there are three international ports of entry along the Mexico-Imperial County border: two at Calexico (Calexico and Calexico-East); and, one at Andrade (near Yuma, Arizona). Traffic from these ports enters California on the I-8 corridor. U.S. Customs and the Border Protection Agency within the DHS are charged with the management and control of the official ports of entry. Security planning includes local emergency services, as well as the CHP.

Caltrans District 11 has developed the California-Baja California Border Master Plan, which establishes a process to institutionalize dialogue among local, State and federal stakeholders in the United States and Mexico. A key objective was to develop criteria that can be used in future studies to coordinate and prioritize projects related to existing and new Ports of Entry (POEs), as well as roads leading to the California Mexico POEs. Security was a major consideration in the development of the Border Master Plan.

[9]National Cooperative Highway Research Project 525 Volume 3 Transportation Planning Process, page 16.
[10]National Cooperative Highway Research Program Report 525 Volume 9 "Guidelines for Transportation Emergency Training Exercises" McCormick Taylor Inc. 2006.

Seaports. The DHS has designated the seaports of Long Beach, Los Angeles, and Port Hueneme as at risk for potential terrorist actions.[11] Security at the ports is the joint responsibility of the U.S. Coast Guard, the U.S. Customs and Border Protection Agency, federal and State Homeland Security offices, Port police agencies, Harbor Patrols and emergency service agencies. The U.S. Coast Guard leads the local Area Maritime Security Commission, which coordinates activities and resources for all port stakeholders.

The Port of Los Angeles has a dedicated police force, the Los Angeles Port Police, to patrol the area within the jurisdiction of the Port of Los Angeles. The Port Police enforce federal, State and local public safety statutes, as well as environmental and maritime safety regulations in order to maintain the free flow of commerce and produce a safe, secure environment that promotes uninterrupted Port operations. In addition, the Port Police partner with other law enforcement agencies, such as the Los Angeles Police Department, CHP, and Customs and Border Protection in the Cargo Theft Interdiction Program (CTIP), which investigates cargo theft, and the High Intensity Drug Trafficking Area, which targets drug trafficking at the Ports of Los Angeles and Long Beach. Furthermore, per the Maritime Transportation Security Act of 2002, the Port of Los Angeles works with the Coast Guard to develop security plans for facilities at the port.

Similar to the Port of Los Angeles, security at the Port of Long Beach entails physical security enhancements, police patrols, coordination with federal, State, and local agencies to develop security plans for the port area and investigate suspicious incidents, and obtaining federal funding to pay for these enhancements. As with the Port of Los Angeles, the Port of Long Beach works with the Coast Guard to develop security plans for facilities at the port.

In contrast to the Port of Los Angeles, however, the Port of Long Beach does not have its own dedicated police force. Instead, the Long Beach Police Department is responsible for patrolling the port area. In doing so, the Port reimburses the Long Beach Police and Fire Departments for their port related activities and expenses. The Port also funds its own Harbor Patrol to supplement law enforcement work conducted by other agencies such as the Coast Guard.

In addition to the above, several programs are in place to effectively monitor and screen seaport cargo. They include:

Investigations: The federal Container Security Initiative (CSI) directs Customs agents, working with host governments, to inspect and examine all cargo containers deemed high-risk before they are loaded on U.S.-bound vessels. The CSI contains four core elements: identifying high-risk containers, pre-screening containers before they reach U.S. ports of entry, using technology to prescreen high-risk containers and developing and using smart and secure containers.

Inspections: The 24-hour rule requires manifest information on cargo containers to be delivered to U.S. Customs 24 hours before the container is loaded onto a vessel in a foreign port. Customs has the right to stop any container from being loaded, for any reason, while the container is still overseas.

Partnerships: Most of the largest U.S. importers and their trading partners participate in the Customs-Trade Partnership Against Terrorism (C-TPAT), a public-private partnership designed to improve security standards throughout the cargo supply chain.

Technology: U.S. Customs uses X-ray, gamma ray and radiation-detection devices to screen incoming cargo at U.S. ports.

Airports. The SCAG region supports the nation's largest regional airport system in terms of number of airports and aircraft operations, operating in a very complex airspace environment. The system has six established air carrier airports including Los Angeles International (LAX), Bob Hope (formerly Burbank), John Wayne, Long Beach, LA/Ontario International and Palm Springs. There are also three emerging air

[11] Fiscal Year 2006 Infrastructure Protection Program. U.S. Department of Homeland Security, September 25, 2006.

carrier airports in the Inland Empire and North Los Angeles County. These include San Bernardino International Airport (formerly Norton Air Force Base), March Inland Port (joint use with March Air Reserve Base) and Southern California Logistics Airport (formerly George Air Force Base). Palmdale Airport (joint use with Air Force Plant 42) was once thought to be a potential regional airport; however, it is currently a general aviation facility. The only commercial airline - United Airlines - that serviced the Airport with flights to/from San Francisco ceased operations in December 2008. There is no indication presently of any commercial air service, and Los Angeles World Airport has surrendered its federal certification to operate Palmdale Regional as a commercial facility. The airport features a modern 9,000-square-foot terminal capable of handling up to 300,000 passengers annually. The regional system includes 45 general aviation airports and two commuter airports, for a total of 57 public use airports.

Airport security planning is the joint responsibility of the federal Transportation Security Administration (TSA), the airlines, and the individual airports. Airports in the SCAG region have upgraded their security systems since 9/11 using a variety of strategies in conjunction with local, State and federal law enforcement. However, a number of aviation vulnerabilities continue to persist. These included effective screening of passengers and baggage for threat objects and explosives, adequate controls for limiting access to secure areas at airports, and adequate security for air traffic control computer systems and facilities.

Rail and Mass Transit. The dispersed nature and the daily volume of passengers using public transportation services, which include intercity passenger rail, commuter rail, subway systems, and bus transportation, make it an attractive target for terrorists and criminals. Today, regional transit in the SCAG region is comprised of:

- Approximately 640 bus routes
- Approximately 67 local bus (demand response and paratransit) operators
- 13 commuter express bus services[12]
- Two subway lines and 3 light rail lines situated within Los Angeles County

The numbers of customers using public transportation each and every day creates ongoing challenges for enhancing security within transit environments. A number of plans have been implemented to provide for basic protection. In the early 1990s, the California Public Utilities Commission required that transit agencies operating rail systems prepare a comprehensive System Safety Program Plan (SSPP) that also included a security component. Since 2004, all transit agencies are required to include a security and emergency management plan, which details how the agency would coordinate with first responder (law enforcement and fire) agencies, their respective County Office of Emergency Services and the Statewide Standardized Emergency Management System (SEMS).

Public Transit, Bicycle, or Pedestrian Facilities

Public Transit. In Southern California public transit service is comprised of local and express buses, transitways, Rapid Bus, urban rail, including subway and light rail principally centered in the core of Los Angeles County, commuter rail that spans five counties and shuttles/circulators that feed all transportation modes and activity centers. Transit service is provided by approximately 67 separate public agencies. 12 of these agencies provide 91 percent of the existing public bus transit service. Local service is supplemented by municipal lines and shuttle services. Private bus companies provide additional regional service.

Many people depend on reliable transit service to participate in the economic, cultural and social benefits of Southern California. Transit ridership was approximately 708 million in 2010.[13] The largest provider of public transit service in Imperial County is Imperial Valley Transit which serves the cities and communities

[12]Santa Clarita, Antelope Valley, LADOT and VISTA operate Commuter Express bus services. Santa Monica, Foothill, Montebello, Torrance, Gardena and Orange County operate local limited bus service into downtown Los Angeles.
[13]SCAG Transit Data Collection, 2011.

of Brawley, Bombay Beach, Calexico, Calipatria, El Centro, Heber, Hotville, Imperial, Niland, Ocotillo, Salton Sea, Seeley, Westmorland, and Winterhaven. There are approximately 28 routes with multiple trips daily Monday through Friday and a reduced schedule on Saturdays. In 2010, the system experienced approximately 49,000 average monthly boardings, and approximately 15 percent of the system's operating expenses were recovered through passenger fares.[14]

The largest provider of public transit service in Los Angeles County is the Los Angeles County Metropolitan Transportation Authority (Metro). Metro operates a comprehensive network of fixed-route bus routes and an urban light rail system (Metro Rail) and subway. Among the fixed-route bus services operated by the Metro is Metro Rapid Bus, which consists of a simple route layout, frequent service, less frequent stops, low-level buses for fast boarding and exiting, color-coded buses and stop, and bus priority at intersections. In 2010, the system experienced approximately 41.9-million average monthly boardings, and approximately 24 percent of the system's bus operating expenses were recovered through passenger fares.[15]

The largest provider of public transit service in Orange County is the Orange County Transportation Authority (OCTA), which operates 77 bus local and express routes and approximately 62,000 bus stops located throughout the urbanized portions of Orange County. In 2010, the system experienced approximately 4.8 million average monthly boardings, and approximately 25 percent of the system's operating expenses were recovered through passenger fares.[16]

The largest provider of public transit service in Riverside County is the Riverside Transit Agency (RTA), which is the primary provider of fixed-route and paratransit services throughout a 2,500 square mile service area in the western portion of the county. It operates 231 buses on approximately 43 local and express routes. In 2010, the system experienced approximately 950,000 average monthly boardings, and approximately 15 percent of the system's operating expenses were recovered through passenger fares.[17]

The largest provider of public transit service in San Bernardino County is Omnitrans, which provides bus and paratransit services in a 480 square mile area in Southwestern San Bernardino County, which includes the cities and communities of Chino, Colton, Fontana, Loma Linda, Montclair, Ontario, Redlands, Rialto, San Bernardino, Upland, Chino Hills, Grand Terrace, Highland, Rancho Cucamonga, Yucaipa, Bloomington, Mentone and Muscoy. It operates a fleet of more than 277 buses over approximately 27 routes. In 2010, the system experienced approximately 1.3 million average monthly boardings, and approximately 23 percent of the system's operating expenses were recovered through passenger fares.[18]

The largest provider of public transit service in Ventura County is Gold Coast Transit, which provides bus and paratransit services over 91 square miles in the western portion of the county. Service is provided to the cities of Ojai, Oxnard, Port Hueneme, Ventura and the unincorporated areas in between the cities. It operates a fleet of 78 buses over approximately 18 routes. In the fiscal year 2010, the system experienced approximately 407,000 average monthly boardings, and approximately 20 percent of the system's operating expenses were recovered through passenger fares.[19]

Rail transit ridership has been steadily increasing as new routes have been added. Commuter rail service has continued to grow steadily since its introduction in 1992, both in service and patronage. A summary of the current service and patronage for the largest transit operators in each county is presented in **Table 3.12-12**.

[14]National Transit Database, 2011.
[15]*Ibid*.
[16]*Ibid.*
[17]*Ibid*.
[18]*Ibid*.
[19]*Ibid*.

TABLE 3.12-12: STATISTICS FOR MAJOR TRANSIT OPERATORS (2010)

County	Largest Transit Operator	Average Weekday Boardings	Annual Boardings	Annual Vehicle Revenue Miles(VRM)	Passenger Fares as a % of Operation Expenses*
FIXED ROUTE BUS SERVICE					
Imperial	IVT	2,000	593,000	666,000	15.2%
Los Angeles	Metro	1,579,000	503,071,000	139,274,000	24.4%
Orange	OCTA	182,000	58,104,000	21,666,000	25.1%
Riverside	RTA	36,000	11,368,000	10,163,000	15.2%
San Bernardino	Omnitrans	49,000	15,685,000	10,035,000	22.9%
Ventura	Gold Coast Transit	15,000	4,880,000	3,853,000	19.6%
METRO RAIL – HEAVY RAIL					
Los Angeles	Metro	150,000	47,906,000	5,885,000	38.7%
METRO RAIL – LIGHT RAIL					
Los Angeles	Metro	146,000	46,409,000	9,646,000	18.3%
REGIONAL COMMUTER RAIL					
Various	SCRRA (Metrolink)	38,000	12,006,000	10,479,000	42.4%

SOURCE: National Transit Database, 2011.

Metro Rail System

Existing urban rail lines (Metro Rail) are located in Los Angeles County and are operated by Metro. They include the Metro Blue Line from Long Beach to Downtown Los Angeles, the Metro Green Line from Redondo Beach to Norwalk, the Metro Red Line subway, from Union Station to North Hollywood. The Metro Purple Line subway follows the Red Line from Union Station to Wilshire and Vermont but branches off to Western Avenue as shown in **Map 3.12-5** located in Chapter 8.0 (Maps), and the Metro Gold Line which runs from East Los Angeles (Atlantic station) to Pasadena via Union Station. The Metro Rail system is operated seven days a week. A system total of 79 route miles serves a total of 73 stations. Ridership on the Metro Rail system is approximately 303,000 boardings every day.[20]

Regional Commuter Rail

Commuter rail service is operated by the Southern California Regional Rail Authority (SCRRA). In October of 1992, the SCRRA began initial operation of the Metrolink commuter rail system on three lines. Service on the initial system was greatly expanded after the 1994 Northridge earthquake. Currently SCRRA operates seven routes including five from downtown Los Angeles to Ventura, Lancaster, San Bernardino, Riverside, and Oceanside, from San Bernardino to Oceanside, and from Riverside via Fullerton or City of Industry to downtown Los Angeles. As of September 2010, the system operated 144 trains on weekdays, 40 on Saturdays and 26 on Sundays to 55 stations on 512 route miles. Average weekday ridership is approximately 40,544 passengers.[21]

Amtrak provides significant regional and inter-regional service on the LOSSAN—San Diego to San Luis Obispo corridor (also known as Amtrak's Pacific Surfliner corridor) operating twelve daily round-trip services, which stop at the Los Angeles Union Station. Additionally, Amtrak operates four interstate routes

[20] Los Angeles Metropolitan Transportation Authority. Facts at a Glance – October 2011, 2011.
[21] Southern California Regional Rail Authority. (2010). http://www.metrolinktrains.com/about/?id=6, accessed September 2011.

within the region (Coast Starlight, Sunset Limited, Southwest Chief and Texas Eagle) that on average have one daily trip.[22] These regional commuter rail lines are shown in **Map 3.12-5** located in Chapter 8.0 (Maps).

Shuttles and Demand-Responsive Services

One component of the region's public transit system consists of publicly operated or funded demand-response taxis and dial-a-ride services; some open to the general public, others limited to elderly and disabled use. It also includes locally operated or funded shuttle buses (e.g., Los Angeles DASH, Pasadena ARTS, Glendale Beeline, Cerritos on Wheels, El Monte Transit, Riverside Orange Blossom, etc.). Access Paratransit, the largest provider of transportation services for the disabled in the region, operates in the vicinity of fixed-route bus and rail lines in Los Angeles County and extends into portions of the surrounding counties of San Bernardino, Orange and Ventura. These systems serve as local shuttles, internal circulators, connectors to other public transit, or as shoppers' shuttles. Service on these systems is usually limited to a prescribed geographic area.[23]

Bicycle and Pedestrian Facilities (Non-motorized Transportation)

Biking and walking primarily constitutes non-motorized transportation. Non-motorized transportation plays a bigger role in the densely-populated, mixed-land-use areas of the region. In 2009 biking and walking accounts for approximately 20.9 percent of total trips and 3.2 percent of trips to work or university from home.[24]

The region's bikeways encourage non-motorized travel, serve as recreational facility, and provide inexpensive, environmentally-friendly transportation opportunities. Class I bikeways are separate shared-use paths also used by pedestrians, Class II bikeways are striped lanes in streets, and Class III bikeways are signed routes. Nearly 4,615 miles of Class I and II bikeways exist through the region, as well as mountain bike trails, some of which are also designated for hiking and horseback riding.[25] The City of Los Angeles alone has more than 216 miles of Class I and II bikeways. Bike rack, locker and station programs are ongoing in a number of cities and transit operators. In addition, transit operators are integrating bicycle transportation with transit via bus bike racks, bike-on-train programs and bicycle lockers at transit centers. **Map 3.12-6** located in Chapter 8.0 (Maps) shows the regional bicycle.

Pedestrian access at and near public transit, in most major commercial areas and many residential areas is facilitated by sidewalks, a number of pedestrian malls, and in some cases local jogging and pedestrian trails or paths.

THRESHOLDS OF SIGNIFICANCE

The 2012-2035 RTP/SCS would have a significant impact related to transportation, traffic and security if it would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

[22] Amtrak. (2011) Routes. http://www.amtrak.com/servlet/ContentServer?c=Page&pagename=am%2FLayout&p=1237405732511&cid=1237608331430, accessed September 2011.
[23] Access Services, About Us. http://www.asila.org/about_us/overview.html, accessed September 2011
[24] City of Los Angeles, *Bicycle Master Plan*, 2011.
[25] SCAG, *Draft 2012 Regional Transportation Plan*, 2011.

- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- Result in inadequate emergency access; and/or
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

The following specific thresholds were developed by SCAG based on precedence as appropriate thresholds by which to determine significant impacts on transportation, traffic and security:

- Generate substantially more total daily Vehicle Miles of Travel (VMT) than the current daily VMT;
- Result in a substantially higher average Vehicle Hours of Delay (VHD) in delay for all trips compared to the current VHD delay;
- Result in substantially greater average delay and percent of total VHD in delay for heavy-duty truck trips than the current condition;
- Result in substantial decrease in the percent of work opportunities within 45 minutes travel time by personal vehicle or by transit, relative to the existing condition;
- Result in a substantially higher system-wide fatality accident rate for all travel modes compared to the existing condition;
- Result in a substantially higher system-wide injury accident rate for all travel modes compared to the existing condition; or
- Cause a cumulatively considerable adverse effect on regional transportation and associated environmental effects.

Methodology

Transportation data was obtained from the SCAG's Regional Travel Demand Model (RTDM, see a detailed description of that model in appendices to the RTP). This regional tool for characterizing the transportation environment divides the region into 11,267 Transportation Analysis Zones. Model inputs include: Socioeconomic Data by Census Block Group; Highway Networks; Land Use and Accessibility for Auto Ownership Model; Land Use, parking, pricing TDM, Walk and Bike for Mode Choice Model; Transit Networks; External Trips (inter-regional trips); Airport Trips and Employment, Commodity Flow, Ports and Warehouse Activities. The model includes modules that address Household Classification (size, number of workers, income, single-family or multi-family unit); Auto Ownership; Trip Generation; Trip Distribution; Mode Choice; Heavy Duty Trucks; Network Assignment; Model Convergence; and Highway Performance Monitoring System (HPMS) VMT-based Post processing.

A detailed description of the RTDM is provided in the Conformity Report, an appendix to the 2012-2035 RTP/SCS. A detailed description of the methodology used to identify growth is provided in the growth and SCS appendices of the RTP.

While the RTP has the ability to influence where growth occurs and therefore traffic in the region, it has no control over the forecasted increase in population growth. The anticipated increase in births over deaths as well as in-migration to the region is the reason that population growth and resulting traffic impacts occur. [26]

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use

[26] The Environmental Justice section of the Plan and associated appendix contains substantial analysis of accessibility and other transportation impacts to low income, minority and other protected groups. See Environmental Justice Appendix of the 2012-2035 RTP/SCS. However, the PEIR does not rely on this analysis as it addresses transportation impacts to the community as a whole.

development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although the similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., the South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of transportation resources includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan were adopted (No Project Alternative). This evaluation is not included in the determination of the significance of impacts (which is based on a comparison of future conditions with the Plan to today); however it provides a meaningful perspective on the effects of the Plan.

Determination of Significance

The significance of impacts was determined by applying the significance criteria above to compare current regional transportation conditions to expected future conditions with the Plan. The RTDM provides performance data for future Plan conditions. The performance measure output for year 2035 with the Plan was compared to the existing regional conditions for each significance criterion to determine the significance of impacts. The 2035 transportation model output provides a regional and cumulative level of analysis for the impacts of the Plan on transportation resources.

IMPACTS

Impact 3.12-1: Potential to increase total daily Vehicle Miles of Travel (VMT) in 2035 compared to current daily VMT. The Plan would result in a significant impact related to VMT.

Regional VMT is related to growth and land use. The expansion of highways and local arterials has slowed down over the last decade. This has occurred in part due to roadway improvements not keeping pace with the growing population, this is at least in part because of increasing costs and environmental concerns. However, there are still critical gaps in the network that hinder access to certain parts of the region and/or hinder efficient regional operations. Locally-developed county transportation plans have identified projects to close these gaps and complete the system, and they are included in the Plan. These projects include the Limited Access Expressway SR-115 in Imperial County, the SR-710 Gap Closure in Los Angeles County, the High Desert Corridor in Los Angeles and San Bernardino Counties, the SR-241 Improvements in Orange County, the CETAP Inter-county Corridor A in Orange and Riverside Counties, and the U.S. 101 and SR-118 Improvements in Ventura County.

Heavy investment in HOV lanes has given the region one of the nation's most comprehensive HOV networks and highest rideshare rates. The Plan proposes strategic HOV gap closures and freeway-to-freeway direct HOV connectors to complete the system. Another key HOV strategy in the Plan is the conversion of certain HOV lanes in the region to allow for continuous access. Orange County has taken a leadership role on this over the past few years, and their recent studies have concluded that continuous-access HOV lanes do not perform any worse than limited-access HOV lanes. At the same time, they provide carpoolers with greater freedom of movement in and out of HOV lanes

Local streets and roads account for over 80 percent of the total road network and carry almost 50 percent of total traffic. They serve different purposes in different parts of the region, or even in different parts of the same city. Many streets serve as major thoroughfares or even alternate parallel routes to congested freeways. At the same time, street right-of-ways often support different modes of transportation besides the automobile,

including bicycles, pedestrians, and transit. The Plan contains a host of arterial projects and improvements to achieve different purposes in different areas. In all parts of the region, it includes operational and technological improvements to maximize system productivity in a more cost-effective way than simply adding capacity. Such strategic improvements include spot widening, signal prioritization, driveway consolidation and relocation, and grade separations at high-volume intersections.

While the Plan's multimodal strategy aims to reduce per capita VMT over the next 25 years, total demand to move people and goods will continue to grow due to the region's population increase. A strategic expansion of the transportation system is needed in order to provide the region with the mobility it needs. The Plan targets this expansion around transportation systems that have room to grow, including transit, high-speed rail, active transportation, express lanes, and goods movement. Some of these systems, such as transit, active transportation, and express lanes, have proven over the years to be a reliable and convenient form of transportation for those who are able to easily access it.

The Plan calls for an impressive expansion of transit facilities and service over the next 25 years. While these capital projects will provide the SCAG region with a much more mature public transportation system, operational improvements and new transit pro-grams and policies will also contribute greatly to attracting more trips to transit and away from single-occupant vehicle travel. First, the expanding HOV and express lane networks calls for the development of an extensive express bus point-to-point network. Second, transit oriented and land use developments call for increasing the frequency and quality of fixed-route bus service by virtue of adding new bus rapid transit service, limited-stop service, increased frequencies along targeted corridors, and the introduction of local community circulators to provide residents of smart growth developments with the option of taking transit over using a car to make short, local trips.

The Plan proposes three passenger rail strategies that will provide additional travel options for long-distance travel within the region and to neighboring regions. These are improvements to the Los Angeles to San Diego Corridor (LOSSAN), improvements to the existing Metrolink system, and the implementation of Phase I of the California High-Speed Train (HST) project.

The recent release of the draft CA HST Business Plan confirmed the funding and implementation challenges of the project. The draft Business Plan now estimates a Phase I cost of $98.5 billion (in year of expenditure dollars) with service extended to the region in 2033. Within the draft Business Plan, there are a variety of strategies to connect Northern and Southern California to the State network. This plan assumes that Southern California will be connected to the network in 2033, but that incremental improvements can be made in advance of and in preparation for that connection. Therefore, stakeholders throughout Southern California are seeking to implement a phased and blended implementation strategy for high-speed rail by employing State and federal high-speed rail funds to improve existing services, eventually meeting the Federal Rail Administration's 110 miles per hour definition of high-speed service. These speed and service improvements to the existing LOSSAN and Metrolink corridors will deliver the California High-Speed Rail Authority's new blended approach, and at the same time permanently improve the region's commuter and intercity rail services.

Another emphasis on transit network improvements includes transit priority facilities, such as bus lanes and traffic signal priority. The region has virtually no bus lanes, especially compared to other major metropolitan areas. The Los Angeles County Metro Rapid Bus network employs bus signal priority that gives buses up to ten percent more green light time from the normal green light phase. This should be expanded to other counties in the region. Additional enhancements to the region's transit services include expanding bike-carrying capacity on transit vehicles, implementing regional and inter-county fare agreements and media, such as LA County's EZ Pass, and expanding and improving real-time passenger information systems.

Active transportation refers to transportation such as walking or using a bicycle, tricycle, velomobile, wheelchair, scooter, skates, skateboard, push scooter, trailer, hand cart, shopping car, or similar electrical devices. In the Plan, active transportation generally refers to bicycling and walking, the two most common

methods. Walking and bicycling are essential parts of the SCAG transportation system and can help reduce roadway congestion. As the region works towards reducing congestion, walking and bicycling will become more essential to meet the future needs of Californians.

Substantial growth and development is anticipated to occur within the region between 2011 and 2035. Despite the regional planning efforts to reduce per capita VMT, predicted growth will increase total VMT. As shown in **Table 3.12-13**, average daily VMT is expected to grow from 448 million miles in 2011 to 517 million miles per day in 2035. This change constitutes a 13.3 percent increase over this period and includes light, medium and heavy-duty vehicle VMT in all six counties.[27] The greatest percentage increase in VMT will occur in Riverside County San followed by Bernardino County. Implementation of Mitigation Measures Mitigation Measures **MM-TR1** through **MM-TR98** would reduce VMT, however, impacts would remain significant.

TABLE 3.12-13: DAILY VEHICLE MILES TRAVELED IN 2012 AND 2035

	In Thousands		
County	**2012**	**2035 No Project**	**2035 Plan**
Imperial	6,000	10,000	10,000
Los Angeles	224,000	252,000	234,000
Orange	75,000	84,000	79,000
Riverside	60,000	89,000	89,000
San Bernardino	61,000	89,000	84,000
Ventura	21,000	23,000	22,000
SCAG Region	448,000	547,000	517,000

SOURCE: SCAG Transportation Modeling 2011, SCSG 2012-2035 RTP/SCS, Highways & Arterials Appendix, Tables A16, page 56, 2011

Impact 3.12-2: The Plan would reduce average Vehicle Hours of Delay (VHD) in 2035 compared to current condition. The Plan would result in less than significant impact related to VHD.

As shown in **Table 3.12-14**, total daily VHD in delay are expected to shrink from 3,277,000 vehicle-hours in 2011 to 3,115,000 vehicle-hours in 2035. This constitutes a decrease from existing conditions and includes light, medium and heavy-duty vehicles VHD in all six counties.[28] Delay would decrease in Los Angeles, Orange, and Ventura Counties and increase in Imperial, Riverside, and San Bernardino Counties. This result is considered to be a regional benefit. Therefore, the Plan would result in a less-than-significant impact related to VHD.

TABLE 3.12-14: TOTAL DAILY HOURS OF DELAY IN 2012 AND 2035

	In Thousands of Vehicle-Hours		
County	**2012**	**2035 No Project**	**2035 Plan**
Imperial	5	25	12
Los Angeles	2,204	3,031	1,895
Orange	493	688	437
Riverside	263	1,244	395
San Bernardino	205	846	279
Ventura	107	181	97
Regional	3,277	6,015	3,115

SOURCE: SCAG Transportation Modeling 2011, SCSG 2012-2035 RTP/SCS, Highways & Arterials Appendix, Tables A16, page 56, 2011

[27] SCAG, Regional Travel Demand Model Results, 2011.
[28] *Ibid*.

Impact 3.12-3: Potential to create substantially greater average daily VHD for heavy-duty truck trips in 2035 compared to current condition. The Plan would result in a significant impact related to truck VHD.

The transportation system is heavily influenced by goods movement, especially by heavy-duty trucks on the roadway network. Recent regional efforts have focused on strategies to develop a coherent, refined, and fully integrated regional goods movement system. In past RTPs, SCAG has envisioned a system of truck-only lanes extending from the San Pedro Bay Ports to downtown Los Angeles along the I-710, connecting to an east-west segment, and finally reaching the I-15 in San Bernardino County. Such a system would address the growing truck traffic on core highways through the region and serve key goods movement industries. Truck-only freight corridors are effective as they add capacity in congested corridors and improve truck operations and safety by separating trucks and autos.

Significant progress towards a regional freight corridor system has continued as evidenced by recent work on an environmental impact report (expected to be completed in 2012) for the I-710 segment. The Plan includes a refined concept for the east-west corridor component of the system and connections to an initial segment of I-15. The East-West Freight Corridor would carry between 58,000 and 70,000 trucks per day - trucks that would be removed from adjacent general-purpose lanes and local arterial roads.

Despite the regional planning efforts to improve the efficiency of goods movement, increased demand for goods will lead to substantial increased in total heavy-duty trucks on the roadway network under the Plan. As shown in **Table 3.12-15**, total daily heavy-duty truck trip VHD in delay are expected to increase from 117,000 average daily heavy-duty truck vehicle hours of delay in 2012 to 158,000 hours in 2035. This constitutes a 35 percent increase from conditions in 2012.[29] Implementation of Mitigation Measures Mitigation Measures **MM-TR1** through **MM-TR98** would reduce criteria pollutant impacts, however, impacts would remain significant.

TABLE 3.12-15: TOTAL DAILY HEAVY-DUTY TRUCKS TRIPS HOURS OF DELAY IN 2012 AND 2035

	In Thousands of Hours		
County	**2012 Base Year**	**2035 No Project**	**2035 Plan**
Imperial	0	2	1
Los Angeles	72	154	81
Orange	15	29	18
Riverside	14	73	30
San Bernardino	13	91	24
Ventura	3	6	4
Regional	117	354	158

SOURCE: SCAG Transportation Modeling 2011, SCSG 2012-2035 RTP/SCS, Highways & Arterials Appendix, Tables A16, page 56, 2011

Impact 3.12-4: Potential to increase the percent of work opportunities within 45 minutes travel time by personal vehicle or by transit in 2035 relative to the current condition. This result is considered to be a regional benefit. The Plan would result in a less-than-significant impact related to work commute.

PM peak period work trips were used to assess impacts to work commute as the evening is this is the portion of the day prone to the most vehicle delay. It was determined that 45 minutes represents a reasonable benchmark to account for commute lengths for both the auto and transit modes.

As shown in **Table 3.12-16**, 79 percent of the Existing PM peak period work trips take 45 minutes or less by single occupancy vehicle, 73 percent of the Existing PM peak period work trips take 45 minutes or less by high occupancy vehicle, and 22 percent occur within 45 minutes by transit.

[29] *Ibid.*

TABLE 3.12-16: PERCENTAGE OF PM PEAK PERIOD WORK TRIPS COMPLETED WITHIN 45 MINUTES			
County	**2012**	**2035 No Project**	**2035 Plan**
AUTOS –SINGLE OCCUPANCY VEHICLES			
Imperial	97%	96%	96%
Los Angeles	76%	76%	80%
Orange	87%	87%	88%
Riverside	77%	75%	81%
San Bernardino	78%	79%	80%
Ventura	80%	81%	82%
Region	79%	79%	82%
AUTOS – HIGH OCCUPANCY VEHICLES			
Imperial	90%	89%	87%
Los Angeles	73%	65%	77%
Orange	83%	83%	85%
Riverside	67%	64%	74%
San Bernardino	64%	61%	68%
Ventura	73%	70%	73%
Region	73%	68%	77%
TRANSIT			
Imperial	4%	4%	5%
Los Angeles	25%	22%	24%
Orange	12%	12%	12%
Riverside	9%	7%	9%
San Bernardino	4%	5%	6%
Ventura	9%	8%	9%
Region	22%	20%	21%
SOURCE: SCAG Transportation Modeling 2011.			

In 2035, with the implementation of the Plan, 82 percent of the PM peak period work trips take 45 minutes or less by single occupancy vehicle, 77 percent of the PM peak period work trips take 45 minutes or less by high occupancy vehicle, and 21 percent occur within 45 minutes by transit.

There would be an increase in the percent of work opportunities within 45 minutes travel time by personal vehicle as compared to the current condition. The transit percentage would remain approximately the same. This result is considered to be a regional benefit. Therefore, the Plan would result in a less-than-significant impact related to work commute.

Impact 3.12-5: Potential to lower system-wide fatality accident rate for all travel modes in 2035 relative to the current condition. The Plan would result in a less-than-significant impact related to transportation fatality rates.

The Plan includes Transportation System Management strategies that improve safety through reducing the concentration of weaving and merging and that clear existing incidents and accidents more quickly. It was assumed that SCAG goals and the goals/actions outlined in the California Strategic Highway Safety Plan would reduce fatalities and injuries by 25 percent based on recent trends. As shown in **Table 3.12-17**, implementation of the Plan would result in a system-wide daily fatality rate of 0.17 fatalities per million persons for all travel modes, a decrease of 0.03 daily fatalities per million persons when compared to the existing rate of 0.20. Therefore, the Plan would result in a less-than-significant impact related to transportation fatality rates.

TABLE 3.12-17: EXISTING AND 2035 REGIONAL TRANSPORTATION SYSTEM ACCIDENT RATES

Daily Per Million Persons	2012	2035 No Project	2035 Plan
Fatalities	0.20	0.18	0.17
Injuries	18.27	13.67	12.93

SOURCE: SCAG Transportation Modeling 2011.

Impact 3.14-6: Potential to lower system-wide injury rate for all travel modes in 2035 relative to the current condition. Therefore, the Plan would result in a less-than-significant impact related to transportation injury rates.

The Plan includes Transportation System Management strategies that improve safety through reducing the concentration of weaving and merging, and that clear existing incidents and accidents more quickly, among other measures. As shown in **Table 3.12-17**, implementation of the Plan would result in a system-wide daily injury rate of 12.93 injuries per million persons for all travel modes, a decrease of 5.34 daily injuries per million persons when compared to the existing rate of 18.27. Therefore, the Plan would result in a less-than-significant impact related to transportation injury rates.

Cumulative Impact 3.12-7: Potential to contribute to a cumulatively considerable amount of transportation impacts, such as VMT and all-vehicle VHD, in areas outside of the SCAG region.

The RTDM analyzes the population, households, and employment projected for 2035, which is anticipated to be the year with the largest demand on the transportation system expected during the lifetime of the Plan. In accounting for the effects of regional growth, the model output provides a long-term and cumulative level of analysis for the impacts of the Plan on transportation resources. Forecast urban development and growth that would be accommodated by the transportation investments in the Plan, together with the increased mobility provided by the Plan would contribute to the significant impacts described in Impacts 3.12-1, 3.12-2, and 3.12-3 above. The regional growth, and thus cumulative impacts, is captured in the VMT, VHD, and heavy-duty truck VHD data reported for the above impacts.

As the population increases through 2035, the number of trips originating and ending in Santa Barbara, San Diego, and Kern counties to and from the SCAG region is anticipated to increase. The transportation demand from growth, in combination with the accommodating projects within the Plan would contribute to a cumulatively considerable transportation impact in these areas and potentially beyond.

MITIGATION MEASURES

Mitigation Measures **MM-TR1** through **MM-TR16** shall be implemented by SCAG over the lifetime of the 2012-2035 RTP/SCS. Mitigation Measures **MM-TR17** through **MM-TR21** shall be implemented by SCAG and can and should be implemented by project sponsors (for both development and transportation projects) as applicable. Mitigation Measures **MM-TR21** through **MM-TR98** can and should be implemented by project sponsors (for both development and transportation projects) as applicable. Project specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions.

MM-TR1: SCAG shall establish a forum where policy-makers can be educated and can develop consensus on regional transportation safety and security policies

MM-TR2: SCAG shall work with local officials to assist with implementation of regional transportation safety and security policies.

MM-TR3: SCAG shall conduct workshops focused on Smart Growth strategies. Project-specific workshops should be held by local agencies.

MM-TR4: SCAG shall help ensure the rapid repair of transportation infrastructure in the event of an emergency. This will be accomplished by SCAG, in cooperation with local and State agencies, identifying critical infrastructure needs necessary for: a) emergency responders to enter the region, b) evacuation of affected facilities, and c) restoration of utilities. In addition, SCAG shall establish transportation infrastructure practices that promote and enhance security.

MM-TR5: SCAG shall continue to promote the use of intelligent transportation system (ITS) technologies that enhance transportation security. SCAG should work to expand the use of ITS to improve surveillance, monitoring and distress notification systems and to assist in the rapid evacuation of disaster areas. SCAG shall facilitate the incorporation of security into the Regional ITS Architecture. Transit operators should incorporate ITS technologies as part of their security and emergency preparedness and share that information with other operators. Aside from deploying ITS technologies for advanced customer information, transit agencies should work intensely with ethnic, local and disenfranchised communities through public information / outreach sessions ensuring public participation is utilized to its fullest. In case of evacuation, these transit dependent persons may need additional assistance to evacuate to safety.

MM-TR6: SCAG shall establish transportation infrastructure practices that promote and enhance security. SCAG shall work with transportation operators to plan and coordinate transportation projects, as appropriate, with DHS grant projects, to enhance the regional transit security strategy (RTSS). SCAG shall establish transportation infrastructure practices that identify and prioritize the design, retrofit, hardening, and stabilization of critical transportation infrastructure to prevent failure, to minimize loss of life and property, injuries, and avoid long term economic disruption. SCAG shall establish a Transportation Security Working Group (TSWG) with goals of 2012-2035 RTP/SCS consistency with RTSS, and to find ways SCAG programs can enhance RTSS.

MM-TR7: SCAG shall help to enhance the region's ability to deter and respond to acts of terrorism, human-caused or natural disasters through regionally cooperative and collaborative strategies. SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety security policies.

MM-TR8: SCAG shall help to enhance the region's ability to deter and respond to terrorist incidents, human-caused or natural disasters by strengthening relationship and coordination with transportation. This will be accomplished by the following:

- SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety security policies.
- SCAG shall encourage all SCAG elected officials are educated in NIMS.
- SCAG shall work with partner agencies, federal, State and local jurisdictions to improve communications and interoperability and to find opportunities to leverage and effectively utilize transportation and public safety/security resources in support of this effort.

MM-TR9: SCAG shall work to enhance emergency preparedness awareness among public agencies and with the public at large.

MM TR10: SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety security policies.

MM-TR11: SCAG shall work to improve the effectiveness of regional plans by maximizing the sharing and coordination of resources that would allow for proper response by public agencies.

MM-TR12: SCAG shall encourage and provide a forum for local jurisdictions to develop mutual aid agreements for essential government services during any incident recovery

MM-TR13: SCAG shall help to enhance the capabilities of local and regional organizations, including first responders, through provision and sharing of information. This will be accomplished by:

- SCAG shall work with local agencies to collect regional GeoData in a common format, and provide access to the GeoData for emergency planning, training and response.
- SCAG shall establish a forum for cooperation and coordination of these plans and programs among the regional partners including first responders and operations agencies
- SCAG shall develop and establish a regional information sharing strategy, linking SCAG and its member jurisdictions for ongoing sharing and provision of information pertaining to the region's transportation system and other critical infrastructure.

MM-TR14: SCAG shall provide the means for collaboration in planning, communication, and information sharing before, during, or after a regional emergency. This will be accomplished by the following:

- SCAG shall develop and incorporate strategies and actions pertaining to response and prevention of security incidents and events as part of the on-going regional planning activities.
- SCAG shall offer a regional repository of GIS data for use by local agencies in emergency planning, and response, in a standardized format.
- SCAG shall enter into mutual aid agreements with other MPOs to provide this data, in coordination with the California OES in the event that an event disrupts SCAG's ability to function.

MM-TR15: Congestion Pricing: SCAG shall advocate for a regional, market-based system to price or charge for auto trips during peak hours.

MM-TR16: Beyond the currently financially and institutionally feasible measures included in the 2012-2035 RTP/SCS, SCAG shall identify further reduction in VMT, and fuel consumption that could be obtained through land-use strategies, additional car-sharing programs, additional vanpools, additional bicycle programs, and implementation of a universal employee transit access pass (TAP) program.

MM-TR17: SCAG shall (for its employees) and local jurisdictions can and should institute teleconferencing, telecommute and/or flexible work hour programs to reduce unnecessary employee transportation.

MM-TR18: Local jurisdictions can and should create a ride-sharing program. Promote existing ride sharing programs e.g., by designating a certain percentage of parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading for ride sharing vehicles, and providing a web site or message board for coordinating rides.

MM-TR19: SCAG shall and local jurisdictions can and should create or accommodate car sharing programs, e.g., provide parking spaces for car share vehicles at convenient locations accessible by public transportation.

MM-TR20: SCAG shall and local jurisdictions can and should provide a vanpool for employees.

MM-TR21: Transportation Planning: SCAG shall and local jurisdictions can and should ensure that new developments incorporate both local and regional transit measures into the project design that promote the use of alternative modes of transportation.

MM-TR22: As may be appropriate, project sponsors can and should submit fair share traffic payments to the local agency for funding capital improvement projects to accommodate future traffic demand in the area.

MM-TR23: Local jurisdictions can and should coordinate controlled intersections so that traffic passes more efficiently through congested areas. Where traffic signals or streetlights are installed, require the use of Light Emitting Diode (LED) technology.

MM-TR24: Local jurisdictions can and should promote ride sharing programs e.g., by designating a certain percentage of parking spaces for high-occupancy vehicles, providing larger parking spaces to accommodate vans used for ride-sharing, and designating adequate passenger loading and unloading and waiting areas.

MM-TR25: Local jurisdictions can and should encourage the use of car-sharing programs such as ZipCar. Accommodations for such programs include providing parking spaces for the car-share vehicles at convenient locations accessible by public transportation.

MM-TR26: The Plan includes measures intended to reduce vehicle hours of delay. These include: system management, increasing rideshare and work-at-home opportunities to reduce demand on the transportation system, investments in non-motorized transportation, maximizing the benefits of the land use-transportation connection and key transportation investments targeted to reduce delay. SCAG shall encourage local agencies to fully implement these policies and projects.

MM-TR27: The Plan includes measures intended to reduce daily heavy-duty truck vehicle hours of delay. These include: goods movement capacity enhancements, system management, increasing rideshare and work-at-home opportunities to reduce demand on the transportation system, investments in non-motorized transportation, maximizing the benefits of the land use-transportation connection and key transportation investments targeted to reduce heavy-duty truck delay. SCAG shall encourage local agencies to fully implement these policies and projects.

MM-TR28: Project sponsors of a commercial use can and should submit to the Lead Agency (or other appropriate government agency) a Transportation Demand Management (TDM) plan containing strategies to reduce on-site parking demand and single occupancy vehicle travel. The sponsor should implement the approved TDM plan. The TDM should include strategies to increase bicycle, pedestrian, transit, and carpools/vanpool use. All four modes of travel should be considered. Strategies to consider include the following:

- Inclusion of additional bicycle parking, shower, and locker facilities that exceed the requirement

- Construction of bike lanes per the prevailing Bicycle Master Plan (or other similar document)
- Signage and striping onsite to encourage bike safety
- Installation of pedestrian safety elements (such as cross walk striping, curb ramps, countdown signals, bulb outs, etc.) to encourage convenient crossing at arterials
- Installation of amenities such as lighting, street trees, trash and any applicable streetscape plan.
- Direct transit sales or subsidized transit passes
- Guaranteed ride home program
- Pre-tax commuter benefits (checks)
- On-site car-sharing program (such as City Car Share, Zip Car, etc.)
- On-site carpooling program
- Distribution of information concerning alternative transportation options
- Parking spaces sold/leased separately
- Parking management strategies; including attendant/valet parking and shared parking spaces

MM-TR29: Project sponsors and construction contractors can and should meet with the appropriate Lead Agency (or other government agency) to determine traffic management strategies to reduce, to the maximum extent feasible, traffic congestion and the effects of parking demand by construction workers during construction of this project and other nearby projects that could be simultaneously under construction. The project sponsor should develop a construction management plan for review and approval by the Lead Agency (or other government agency as appropriate). The plan should include at least the following items and requirements:

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

- No materials or equipment should be stored on the traveled roadway at any time.
- Prior to construction, a portable toilet facility and a debris box should be installed on the site, and properly maintained through project completion.
- All equipment should be equipped with mufflers.
- Prior to the end of each work-day during construction, the contractor or contractors should pick up and properly dispose of all litter resulting from or related to the project, whether located on the property, within the public rights-of-way, or properties of adjacent or nearby neighbors.

MM-TR30: Local jurisdictions can and should encourage the use of public transit systems by enhancing safety and cleanliness on vehicles and in and around stations, providing shuttle service to public transit, offering public transit incentives and providing public education and publicity about public transportation services.

MM-TR31: Local jurisdictions can and should encourage bicycling and walking by incorporating bicycle lanes into street systems in regional transportation plans, new subdivisions, and large developments, creating bicycle lanes and walking paths directed to the location of schools and other logical points of destination and provide adequate bicycle parking, and encouraging commercial projects to include facilities on-site to encourage employees to bicycle or walk to work.

MM-TR32: Transit agencies can and should encourage bicycling to transit facilities by providing additional bicycle parking, locker facilities, and bike lane access to transit facilities when feasible.

MM-TR33: Project sponsors can and should ensure that prior to construction all necessary local and State road and railroad encroachment permits are obtained. As deemed necessary by the governing jurisdiction, the road encroachment permits may require the contractor to prepare a traffic control plan in accordance with professional engineering standards prior to construction. Traffic control plans should include the following requirements:

- Identification of all roadway locations where special construction techniques (e.g., directional drilling or night construction) would be used to minimize impacts to traffic flow.
- Development of circulation and detour plans to minimize impacts to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone.
- Scheduling of truck trips outside of peak morning and evening commute hours.
- Limiting of lane closures during peak hours to the extent possible.
- Usage of haul routes minimizing truck traffic on local roadways to the extent possible.
- Inclusion of detours for bicycles and pedestrians in all areas potentially affected by project construction.
- Installation of traffic control devices as specified in the California Department of Transportation Manual of Traffic Controls for Construction and Maintenance Work Zones.
- Development and implementation of access plans for highly sensitive land uses such as police and fire stations, transit stations, hospitals, and schools. The access plans would be developed with the facility owner or administrator. To minimize disruption of emergency vehicle access, affected jurisdictions should be asked to identify detours for emergency vehicles, which will then be posted by the contractor. Notify in advance the facility owner or operator of the timing, location, and duration of construction activities and the locations of detours and lane closures.

- Storage of construction materials only in designated areas
- Coordination with local transit agencies for temporary relocation of routes or bus stops in work zones, as necessary.

MM-TR34: Local jurisdictions can and should meet an identified transportation-related benchmark.

MM-TR35: Local jurisdictions can and should adopt a comprehensive parking policy that discourages private vehicle use and encourages the use of alternative transportation.

MM-TR36: Project sponsors can and should build or fund a major transit stop within or near the development.

MM-TR37: Local jurisdictions and transit agencies can and should provide public transit incentives such as free or low-cost monthly transit passes to employees, or free ride areas to residents and customers.

MM-TR38: Local jurisdictions and project sponsors can and should promote "least polluting" ways to connect people and goods to their destinations.

MM-TR39: Local jurisdictions and project sponsors can and should incorporate bicycle lanes, routes and facilities into street systems, new subdivisions, and large developments.

MM-TR40: Local jurisdictions can and should require amenities for non-motorized transportation, such as secure and convenient bicycle parking.

MM-TR41: Local jurisdictions can and should ensure that the project enhances, and does not disrupt or create barriers to, non-motorized transportation.

MM-TR42: Local jurisdictions can and should connect parks and open space through shared pedestrian/bike paths and trails to encourage walking and bicycling.

MM-TR43: Local jurisdictions can and should create bicycle lanes and walking paths directed to the location of schools, parks and other destination points.

MM-TR44: Local jurisdictions can and should work with the school districts to improve pedestrian and bike access to schools and to restore or expand school bus service using lower-emitting vehicles.

MM-TR45: Local jurisdictions and transit agencies can and should provide information on alternative transportation options for consumers, residents, tenants and employees to reduce transportation-related emissions.

MM-TR46: Local jurisdictions can and should educate consumers, residents, tenants and the public about options for reducing motor vehicle-related greenhouse gas emissions. Include information on trip reduction; trip linking; vehicle performance and efficiency (e.g., keeping tires inflated); and low or zero-emission vehicles.

MM-TR47: Local jurisdictions can and should purchase, or create incentives for purchasing, low or zero-emission vehicles.

MM-TR48: Local jurisdictions can and should create local "light vehicle" networks, such as neighborhood electric vehicle systems.

MM-TR49: Local jurisdictions can and should enforce and follow limits idling time for commercial vehicles, including delivery and construction vehicles.

MM-TR50: Local jurisdictions can and should provide the necessary facilities and infrastructure to encourage the use of low or zero-emission vehicles.

MM-TR51: Local jurisdictions can and should reduce GHG emissions by reducing vehicle miles traveled and by increasing or encouraging the use of alternative fuels and transportation technologies.

MM-TR52: Local jurisdictions can and should reduce VMT-related emissions by encouraging the use of public transit through adoption of new development standards that would require improvements to the transit system and infrastructure, increase safety and accessibility, and provide other incentives.

MM-TR53: Project Selection: Local jurisdictions can and should give priority to transportation projects that would contribute to a reduction in vehicle miles traveled per capita, while maintaining economic vitality and sustainability.

MM-TR54: Equal Pedestrian Access Local jurisdictions can and should include separated sidewalks whenever possible, on both sides of all new street improvement projects, except where there are severe topographic or natural resource constraints.

MM-TR55: Public Involvement: Local jurisdictions can and should carry out a comprehensive public involvement and input process that provides information about transportation issues, projects, and processes to community members and other stakeholders, especially to those traditionally underserved by transportation services.

MM-TR56: System Interconnectivity: Local jurisdictions can and should create an interconnected transportation system that allows a shift in travel from private passenger vehicles to alternative modes, including public transit, ride sharing, car sharing, bicycling and walking, by incorporating the following:

- Ensure transportation centers are multi-modal to allow transportation modes to intersect;
- Provide adequate and affordable public transportation choices, including expanded bus routes and service, as well as other transit choices such as shuttles, light rail, and rail;
- To the extent feasible, extend service and hours of operation to underserved arterials and population centers or destinations such as colleges;
- Focus transit resources on high-volume corridors and high-boarding destinations such as colleges, employment centers and regional destinations;
- Coordinate schedules and routes across service lines with neighboring transit authorities;
- Support programs to provide "station cars" for short trips to and from transit nodes (e.g., neighborhood electric vehicles);
- Study the feasibility of providing free transit to areas with residential densities of 15 dwelling units per acre or more, including options such as removing service from less dense, underutilized areas to do so;
- Employ transit-preferential measures, such as signal priority and bypass lanes. Where compatible with adjacent land use designations, right-of-way acquisition or parking removal may occur to accommodate transit-preferential measures or improve access to

transit. The use of access management should be considered where needed to reduce conflicts between transit vehicles and other vehicles;

- Provide safe and convenient access for pedestrians and bicyclists to, across, and along major transit priority streets;
- Use park-and-ride facilities to access transit stations only at ends of regional transitways or where adequate feeder bus service is not feasible.

MM-TR57: Transit System Infrastructure: Local jurisdictions can and should upgrade and maintain transit system infrastructure to enhance public use, including:

- Ensure transit stops and bus lanes are safe, convenient, clean and efficient;
- Ensure transit stops have clearly marked street-level designation, and are accessible;
- Ensure transit stops are safe, sheltered, benches are clean, and lighting is adequate;
- Place transit stations along transit corridors within mixed-use or transit-oriented development areas at intervals of three to four blocks, or no less than one-half mile.

MM-TR58: Customer Service: Transit agencies can and should enhance customer service and system ease-of-use, including:

- Develop a Regional Pass system to reduce the number of different passes and tickets required of system users;
- Implement "Smart Bus" technology, using GPS and electronic displays at transit stops to provide customers with "real-time" arrival and departure time information (and to allow the system operator to respond more quickly and effectively to disruptions in service);
- Investigate the feasibility of an on-line trip-planning program.

MM-TR59: Transit Funding: Local jurisdictions can and should prioritize transportation funding to support a shift from private passenger vehicles to transit and other modes of transportation, including:

- Give funding preference to improvements in public transit over other new infrastructure for private automobile traffic;
- Before funding transportation improvements that increase roadway capacity and VMT, evaluate the feasibility and effectiveness of funding projects that support alternative modes of transportation and reduce VMT, including transit, and bicycle and pedestrian access.

MM-TR60: Transit and Multimodal Impact Fees: Local jurisdictions can and should assess transit and multimodal impact fees on new developments to fund public transportation infrastructure, bicycle infrastructure, pedestrian infrastructure and other multimodal accommodations.

MM-TR61: Local jurisdictions can and should implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions.

MM-TR62: System Monitoring: Local jurisdictions can and should monitor traffic and congestion to determine when and where new transportation facilities are needed in order to increase access and efficiency.

MM-TR63: Arterial Traffic Management: Local jurisdictions can and should modify arterial roadways to allow more efficient bus operation, including bus lanes and signal priority/preemption where necessary.

MM-TR64: Signal Synchronization: Local jurisdictions can and should expand signal timing programs where emissions reduction benefits can be demonstrated, including maintenance of the synchronization system, and will coordinate with adjoining jurisdictions as needed to optimize transit operation while maintaining a free flow of traffic.

MM-TR65: HOV Lanes: Local jurisdictions can and should encourage the construction of high-occupancy vehicle (HOV) lanes or similar mechanisms whenever necessary to relieve congestion and reduce emissions.

MM-TR66: Delivery Schedules: Local jurisdictions can and should establish ordinances or land use permit conditions limiting the hours when deliveries can be made to off-peak hours in high traffic areas.

MM-TR67: Local jurisdictions can and should reduce VMT related-emissions by implementing and supporting trip reduction programs.

MM-TR68: Ride-Share Programs: Local jurisdictions can and should promote ride sharing programs, including:

- Designate a certain percentage of parking spaces for ride-sharing vehicles;
- Designate adequate passenger loading, unloading, and waiting areas for ride-sharing vehicles;
- Provide a web site or message board for coordinating shared rides;
- Encourage private, for-profit community car-sharing, including parking spaces for car share vehicles at convenient locations accessible by public transit;
- Hire or designate a rideshare coordinator to develop and implement ridesharing programs.

MM-TR69: Employer-based Trip Reduction: Local jurisdictions can and should support voluntary, employer-based trip reduction programs, including:

- Provide assistance to regional and local ridesharing organizations;
- Advocate for legislation to maintain and expand incentives for employer ridesharing programs;
- Require the development of Transportation Management Associations for large employers and commercial/ industrial complexes;
- Provide public recognition of effective programs through awards, top ten lists, and other mechanisms.

MM-TR70: Ride Home Programs: Local jurisdictions can and should implement a "guaranteed ride home" program for those who commute by public transit, ride-sharing, or other modes of transportation, and encourage employers to subscribe to or support the program.

MM-TR71: Local Area Shuttles: Transit agencies can and should encourage and utilize shuttles to serve neighborhoods, employment centers and major destinations.

MM-TR72: Local jurisdictions and transit agencies can and should create a free or low-cost local area shuttle system that includes a fixed route to popular tourist destinations or shopping and business centers.

MM-TR73: Local jurisdictions can and should work with existing shuttle service providers to coordinate their services.

MM-TR74: Low- and No-Travel Employment Opportunities: Local jurisdictions can and should facilitate employment opportunities that minimize the need for private vehicle trips, including:

- Amend zoning ordinances and the Development Code to include live/work sites and satellite work centers in appropriate locations;
- Encourage telecommuting options with new and existing employers, through project review and incentives, as appropriate.

MM-TR75: Local jurisdictions can and should support bicycle use as a mode of transportation by enhancing infrastructure to accommodate bicycles and riders, and providing incentives.

MM-TR76: Development Standards for Bicycles: Local jurisdictions can and should establish standards for new development and redevelopment projects to support bicycle use, including:

- Amending the Development Code to include standards for safe pedestrian and bicyclist accommodations, by incorporating the following:
  - "Complete Streets" policies that foster equal access by all users in the roadway design;
  - Bicycle and pedestrian access internally and in connection to other areas through easements;
  - Safe access to public transportation and other non-motorized uses through construction of dedicated paths;
  - Safe road crossings at major intersections, especially for school children and seniors;
  - Adequate, convenient and secure bike parking at public and private facilities and destinations in all urban areas;
  - Street standards will include provisions for bicycle parking within the public right of way.

MM-TR77: Local jurisdictions can and should require new development and redevelopment projects to include bicycle facilities, as appropriate with the new land use, including:

- Construction of weatherproof bicycle facilities where feasible, and at a minimum, bicycle racks or covered, secure parking near the building entrances;
- Provision and maintenance of changing rooms, lockers, and showers at large employers or employment centers.
- Prohibit projects that impede bicycle and pedestrian access, such as large parking areas that cannot be safely crossed by non-motorized vehicles, and developments that block through access on existing or potential bicycle and pedestrian routes;
- Encourage the development of bicycle stations at intermodal hubs, with attended or "valet" bicycle parking, and other amenities such as bicycle rental and repair, and changing areas with lockers and showers;
- Conduct a connectivity analysis of the existing bikeway network to identify gaps, and prioritize bikeway development where gaps exist.

MM-TR78: Bicycle and Pedestrian Trails: Local jurisdictions can and should establish a network of multi-use trails to facilitate safe and direct off-street bicycle and pedestrian travel, and will provide bike racks along these trails at secure, lighted locations.

MM-TR79: Bicycle Safety Program: Local jurisdictions can and should develop and implement a bicycle safety educational program to teach drivers and riders the laws, riding protocols, routes, safety tips, and emergency maneuvers.

MM-TR80: Bicycle and Pedestrian Project Funding: Local jurisdictions can and should pursue and provide enhanced funding for bicycle and pedestrian facilities and access projects, including, as appropriate:

- Apply for regional, State, and federal grants for bicycle and pedestrian infrastructure projects;
- Establish development exactions and impact fees to fund bicycle and pedestrian facilities;
- Use existing revenues, such as State gas tax subventions, sales tax funds, and general fund monies for projects to enhance bicycle use and walking for transportation.

MM-TR81: Bicycle Parking: Local jurisdictions can and should adopt bicycle parking standards that ensure bicycle parking sufficient to accommodate 5 to 10 percent of projected use at all public and commercial facilities, and at a rate of at least one per residential unit in multiple-family developments (suggestion: check language with League of American Bicyclists).

MM-TR82: Local jurisdictions can and should establish parking policies and requirements that capture the true cost of private vehicle use and support alternative modes of transportation.

MM-TR83: Parking Policy: Local jurisdictions can and should adopt a comprehensive parking policy to discourage private vehicle use and encourage the use of alternative transportation by incorporating the following:

- Reduce the available parking spaces for private vehicles while increasing parking spaces for shared vehicles, bicycles, and other alternative modes of transportation;
- Eliminate or reduce minimum parking requirements for new buildings;
- "Unbundle" parking (require that parking is paid for separately and is not included in the base rent for residential and commercial space);
- Use parking pricing to discourage private vehicle use, especially at peak times;
- Create parking benefit districts, which invest meter revenues in pedestrian infrastructure and other public amenities;
- Establish performance pricing of street parking, so that it is expensive enough to promote frequent turnover and keep 15 percent of spaces empty at all times;
- Encourage shared parking programs in mixed-use and transit-oriented development areas.

MM-TR84: Event Parking Policies: Local jurisdictions can and should establish policies and programs to reduce onsite parking demand and promote ride-sharing and public transit at large events, including:

- Promote the use of peripheral parking by increasing on-site parking rates and offering reduced rates for peripheral parking;
- Encourage special event center operators to advertise and offer discounted transit passes with event tickets;
- Encourage special event center operators to advertise and offer discount parking incentives to carpooling patrons, with four or more persons per vehicle for on-site parking;
- Promote the use of bicycles by providing space for the operation of valet bicycle parking service.

MM-TR85: Parking "Cash-out" Program: Local jurisdictions can and should require new office developments with more than 50 employees to offer a Parking "Cash-out" Program to discourage private vehicle use.

MM-TR86: Electric/Alternative Fuel Vehicle Parking: Local jurisdictions can and should require new commercial and retail developments to provide prioritized parking for electric vehicles and vehicles using alternative fuels.

MM-TR87: Local jurisdictions can and should support and promote the use of low- and zero-emission vehicles, and alternative fuels, and other measures to directly reduce emissions from motor vehicles.

MM-TR88: Low and Zero Emission Vehicles: Local jurisdictions can and should support and promote the use of low- and zero-emission vehicles, by doing the following:

- Develop the necessary infrastructure to encourage the use of zero emission vehicles and clean alternative fuels, such as development of electric vehicle charging facilities and conveniently located alternative fueling stations;
- Encourage new construction to include vehicle access to properly wired outdoor receptacles to accommodate ZEV and/or plug in electric hybrids (PHEV);
- Encourage transportation fleet standards to achieve the lowest emissions possible, using a mix of alternate fuels, PZEV or better fleet mixes;
- Establish incentives, as appropriate, to taxicab owners to use alternative fuel or gas-electric hybrid vehicles.

MM-TR89: Vehicle Idling: Local jurisdictions can and should enforce State idling laws for commercial vehicles, including delivery and construction vehicles.

MM-TR90: Pedestrian and Bicycle Promotion: Local jurisdictions can and should work with local community groups and downtown business associations to organize and publicize walking tours and bicycle events, and to encourage pedestrian and bicycle modes of transportation.

MM-TR91: Local jurisdictions can and should organize events and workshops to promote GHG-reducing activities.

MM-TR92: Fleet Replacement: Local jurisdictions and agencies can and should establish a replacement policy and schedule to replace fleet vehicles and equipment with the most fuel efficient vehicles practical, including gasoline hybrid and alternative fuel or electric models.

MM-TR93: Local jurisdictions can and should implement measures to reduce employee vehicle trips and to mitigate emissions impacts from municipal travel.

MM-TR94: Trip Reduction Program: Local jurisdictions can and should implement a program to reduce vehicle trips by employees, including:

- Providing incentives and infrastructure for vanpooling and carpooling, such as pool vehicles, preferred parking, and a website or bulletin board to facilitate ride-sharing;
- Providing subsidized passes for mass transit;
- Offering compressed work hours, off-peak work hours, and telecommuting, where appropriate;
- Offer a guaranteed ride home for employees who use alternative modes of transportation to commute.

MM-TR95: Bicycle Transportation Support: Local jurisdictions can and should promote and support the use of bicycles as transportation, including:

- Providing bicycle stations with secure, covered parking, changing areas with storage lockers and showers, as well as a central facility where minor repairs can be made;
- Providing bicycles, including electric bikes, for employees to use for short trips during business hours;
- Implementing a police-on-bicycles program;
- Providing a bicycle safety program, and information about safe routes to work.

MM-TR96: Municipal Parking Management: Local jurisdictions can and should implement a Parking Management Program to discourage private vehicle use, including:

- Encouraging carpools and vanpools with preferential parking and a reduced parking fee;
- Institute a parking cash-out program;
- Renegotiate employee contracts, where possible, to eliminate parking subsidies;
- Install on-street parking meters with fee structures designed to discourage private vehicle use;
- Establish a parking fee for all single-occupant vehicles.

MM-TR97: Travel Mitigation: Local jurisdictions can and should mitigate business-related travel, especially air travel, through the annual purchase of verified carbon offsets.

MM-TR98: Transit Access to Municipal Facilities: Local jurisdiction and agency facilities can and should be located on major transit corridors, unless their use is plainly incompatible with other uses located along major transit corridors.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Vehicle Miles Traveled

Implementation of Mitigation Measures **MM-TR1** through **MM-TR98** would to reduce VMT. However, 2035 VMT would still be substantially greater than existing VMT. Therefore, the Plan would result in a significant impact related to VMT.

Vehicle Hours Traveled in Delay for All Vehicles

Impacts related to VHD were determined to be less than significant without mitigation because vehicle hours in delay would improve under the Plan.

Vehicle Hours Traveled for Heavy-Duty Trucks

Implementation of Mitigation Measures **MM-TR1** through **MM-TR98** would reduce VHD for heavy trucks. However, the 2035 heavy-duty truck VHD would still be substantially greater than the existing VHD. Therefore, the Plan would result in a significant and unavoidable impact related to heavy-duty truck VHD.

Worker Commute

Impacts related to worker commute were determined to be less than significant without mitigation as the percentage of trips occurring within 45 minutes would increase under the Plan compared to today.

Transportation System Fatality Rate

Impacts related transportation system fatality rates were determined to be less than significant without mitigation because fatality rates are anticipated to decrease.

Transportation System Injury Rate

Impacts related to transportation system injury rates were determined to be less than significant without mitigation because injury rates are anticipated to decrease.

Cumulative Effects

Implementation of Mitigation Measures **MM-TR1** through **MM-TR98** identified in the Plan would be expected to reduce VMT and VHD. However, as the population increases through 2035, the number of trips originating and ending in Santa Barbara, San Diego and Kern counties to and from the SCAG region would increase. The transportation demand from growth, in combination with the accommodating projects in the Plan would contribute to a cumulatively considerable transportation impact in these other counties.

COMPARISION WITH THE NO PROJECT ALTERNATIVE

Direct Impacts

Vehicle Miles Traveled. The relationship between the VMT in 2035 with implementation of the Plan and without implementation of the Plan (the No Project Alternative) is shown in **Table 3.12-13**. The No Project Alternative would not include transportation and land use strategies that focus growth along existing corridors and in urbanized areas. As a result, population would be more scattered thought the region when compared to the Plan, and per capita VMT would not be reduced and other transportation metrics would not be improved. Implementation of the Plan would reduce vehicle miles of travel in 2035 from 547 million miles to 517 million miles. This constitutes a seven percent decrease from the No Project Alternative. **The Plan impact would be less than the No Project impacts for Impact 3.12-1.**

Vehicle Hours Traveled for All Vehicles in Delay. The relationship between the VHD in delay 2035 with implementation of the Plan and without implementation of the Plan (the No Project Alternative) is shown in **Table 3.12-4.** Implementation of the Plan would reduce VHD in 2035 from 6,015 thousand vehicle-hours to 3,115 thousand vehicle-hours. This constitutes a 48 percent decrease from the No Project Alternative and includes light, medium and heavy-duty truck VHD in all six counties. **The Plan impact would be less than the No Project impact for Impact 3.12-2.**

Vehicle Hours Traveled in Delay for Heavy-Duty Trucks. The relationship between the heavy-duty truck VHD in 2035 with implementation of the Plan and without implementation of the Plan (the No Project Alternative) is shown in **Table 3.12-15**. Implementation of the Plan would reduce heavy-duty truck VHD in 2035 from 354,000 hours to 158,000 thousand hours. This constitutes a 55 percent decrease from the No Project Alternative. **The Plan impact would be less than the No Project impacts for Impact 3.12-3.**

Worker Commute. The relationships between the percent of work opportunities within 45 minutes travel time with implementation of the Plan and without implementation of the Plan (the No Project alternative) are shown in **Table 3.12-16**. Implementation of the No Project Alternative would decrease the work opportunities within 45 minutes travel time by single occupancy vehicle in 2035 as compared to the Plan from 82 percent to 79 percent, would decrease the work opportunities within 45 minutes travel time by high occupancy vehicle from 77 to 68 percent, and would decrease the work opportunities within 45 minutes travel time by transit from 21 to 20 percent. The No Project Alternative would not improve the percent of

work opportunities within 45 minutes travel time. **The Plan impact would be less than the No Project impacts for Impact 3.12-4.**

Transportation System Fatality Rate. The relationship between the transportation fatality rates in 2035 with implementation of the Plan and without implementation of the 2012-2035 RTP/SCS (the No Project Alternative) is shown in **Table 3.12-17**. Implementation of the Plan would result in a system-wide daily fatality rate of 0.17 fatalities per million persons for all travel modes, a decrease of 0.01 daily fatalities per million persons when compared to the No Project Alternative rate of 0.18. **The Plan impact would be less than the No Project impact for Impact 3.12-5.**

Transportation System Injury Rate. The relationship between the transportation injury rates in 2035 with implementation of the Plan and without implementation of the 2012-2035 RTP/SCS (the No Project Alternative) is shown in **Table 3.12-17**. Implementation of the Plan would result in a system-wide daily injury rate of 12.93 injuries per million persons for all travel modes, a decrease of 5.34 daily injuries per million persons when compared to the No Project Alternative rate of 13.67. **The Plan impact would be less than the No Project impact for Impact 3.12-6.**

Indirect Impacts

The Plan includes transportation and land use strategies that focus growth along existing corridors and in urbanized areas, rather than allowing development of vacant, open space/recreation and agricultural lands. This compact development pattern included in the Plan would concentrate population in urban areas and encourage alternative modes of travel other than automobiles. Without the planned development patterns, vehicles miles travels, vehicle hours of delay, worker commute trips, and accident rates would be higher than under the Plan. **The Plan impacts would be less than the No Project impacts for Impact 3.12-7.**

3.13 WATER RESOURCES

This section describes the current water resources in the SCAG region, discusses the potential impacts of the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategies (2012-2035 RTP/SCS or Plan) on water resources, identifies mitigation measures for the impacts, and evaluates the residual impacts.

REGULATORY FRAMEWORK

Federal

Clean Water Act (CWA). The CWA (33 U.S.C. Section 1251 et seq), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the water of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source pollution and certain non-point source discharges to waters of the U.S. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). In California, NPDES permitting authority is delegated to, and administered by, the nine Regional Water Quality Control Board (RWQCB), shown on **Map 3.13-1** located in Chapter 8.0 (Maps).

The U.S. Environmental Protection Agency (USEPA). The USEPA is the federal agency responsible for water quality management and administration of the CWA. The USEPA has delegated most of the administration of the CWA in California to the State Water Resources Control Board (SWRCB). Much of the responsibility for implementation of the SWRCB's policies is delegated to the RWQCB, as described below. USEPA conducts groundwater protection and contaminated site remediation programs, such as installation of groundwater cleanup systems.

Safe Drinking Water Act (SDWA). The SDWA ensures the quality of Americans' drinking water. The law requires actions to protect drinking water and its sources—rivers, lakes, reservoirs, springs and groundwater wells—and applies to public water systems serving 25 or more people. It authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants. In addition, it oversees the states, municipalities and water suppliers that implement the standards.

USEPA standards are developed as a Maximum Contaminant Level (MCL) for each chemical or microbe. The MCL is the concentration that is not anticipated to produce adverse health effects after a lifetime of exposure, based upon toxicity data and risk assessment principles. EPA's goal in setting MCLs is to assure that even small violations for a period of time do not pose significant risk to the public's health over the long run. National Primary Drinking Water Regulations (NPDWRs, or primary standards) are legally enforceable standards that limit the levels of contaminants in drinking water supplied by public water systems.

Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. USEPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.

United States Army Corps of Engineers (Corps). Section 404 of the CWA obligates the Corps to issue permits for the movement of dredge and fill material into and from "waters of the United States." Additionally Section 404 requires permits for activities affecting hydrologically important areas. For example, alterations of wetlands, rivers or ephemeral creek beds resulting from construction activities require Section 404 permits.

The Federal Emergency Management Act (FEMA). The U.S. Congress passed the National Flood Insurance Act in 1968 and the Flood Disaster Protection Act in 1973 in order to restrict certain types of development on floodplains and provide for a national flood insurance program. The purpose of these programs is to reduce the need for large publicly funded flood control structures and disaster relief.

FEMA administers the National Flood Insurance Program. **Map 3.13-2**, located in Chapter 8.0 (Maps), identifies federally designated flood hazard zones in the SCAG region.

FEMA classifies flood hazard zones as follows:

- Zone A – Areas of 100-year flood. Base flood elevations and flood hazard factors are not determined;
- Zone B – Areas between the limits of the 100-year flood and 500-year flood; or certain areas subject to the 100-year flooding with average depth of less than one foot; or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood; and
- Zone C – Areas of minimal flooding not requiring flood insurance.

United States Bureau of Reclamation (USBR). The USBR operates the Colorado River project, an extensive network of dams, canals, and related facilities. The USBR serves as Watermaster, overseeing contentious water rights issues, and running drought protection programs.

State

The California State Water Resources Control Board (SWRCB). Section 303(d) of the CWA requires the SWRCB to list impaired water bodies in the State and determine total maximum daily loads (TMDLs) of pollutants or other stressors that are contributing excessively to these impaired waters. SWRCB is also responsible for granting water rights permits, approving water right transfers, investigating violations, and may reconsider or amend water rights.

As described above, the EPA has delegated most of the administration of the CWA in California to the SWRCB. In turn, much of the responsibility for the implementation of the SWRCB's policies is delegated to the nine RWQCBs. The nine RWQCBs develop and enforce water quality objectives and implementation plans.

Five RWQCBs have jurisdiction in the SCAG region:

- Los Angeles
- Lahontan
- Colorado River Basin
- Santa Ana
- San Diego

The Los Angeles, Lahontan, and Colorado River Basin RWQCBs also have jurisdiction in counties outside the SCAG region. The San Diego RWQCB has jurisdiction in portions of Orange County and Riverside County.

The federal CWA directs states to review water quality standards every three years and, as appropriate, modify and adopt new standards. CWA also regulates wastewater operation through state boards. CWA authorizes the EPA to administer requirements primarily to deal with the quality of effluent which may be discharged from treatment facilities, the recycling of residual solids generated in the process, the reuse of reclaimed water for irrigation and industrial uses to conserve potable water, and the nature of waste material (particularly industrial) discharged into the collection system.

The Department of Water Resources (DWR). The DWR is responsible for the planning, construction, and operation of State Water Project (SWP) facilities, including the California Aqueduct. It also sets conditions

on use of SWP facilities. In addition, DWR is responsible for statewide water planning, evaluating urban water management plans, overseeing dam safety and flood control, and transfer of certain water rights permits (e.g., pre-1914).

The California Department of Public Health (DPH). The DPH implements the SDWA. In addition, it oversees the operational permitting and regulatory oversight of public water systems. DPH requires public water systems to perform routine monitoring for regulated contaminants that may be present in their drinking water supply. To meet water quality standards and comply with regulations, a water system with a contaminant exceeding an MCL must notify the public and remove the source from service or initiate a process and schedule to install treatment for removing the contaminant. Health violations occur when the contaminant amount exceeds the safety standard (MCL) or when water is not treated properly. In California, compliance is usually determined at the wellhead or the surface water intake. Monitoring violations involve failure to conduct or to report in a timely fashion the results of required monitoring.

In addition, DPH conducts water source assessments, oversees water recycling projects, permits water treatment devices, certifies water system employees, promotes water system security, and administers grants under the State Revolving Fund and State bonds for water system improvements.

The California Department of Toxic Substances Control (DTSC). DTSC is responsible for oversight of hazardous substances and remediation of contaminated sites, including water sources in some cases.

The California Department of Fish and Game (CDFG). DFG has jurisdiction over conservation and protection of fish, wildlife, plants, and habitat. CDFG determines stream flow requirements in certain streams, acts as permitting agency for streambed alterations, presents evidence at water rights hearings on the needs of fish and wildlife, and enforces the California Endangered Species Act.

Porter Cologne Water Quality Control Act. The Porter Cologne Water Quality Control Act of 1967 (Water Code Section 13000 et seq.), requires the SWRCB and the nine RWQCBs to adopt water quality criteria to protect State waters. These criteria include the identification of beneficial uses, narrative to the applicable and numerical water quality standards, and implementation procedures.

The Porter-Cologne Water Quality Control Act authorizes the State boards to adopt, review, and revise policies for all waters of the state (including both surface and ground waters) and directs the regional boards to develop Basin Plans. The act also authorizes State boards to adopt Water Quality Control Plans. In the event of inconsistencies among State and regional board plans, the more stringent provisions apply.

Local

In addition to federal and State regulations, cities, counties, and water districts, in the SCAG region may also provide regulatory advisement regarding water resources. Many jurisdictions incorporate policies related to water resources in their municipal codes, development standards, or other regulations.

EXISTING SETTING

Climate

The climate of the SCAG region varies widely between the coastal and inland areas. Coastal areas are characterized by long, hot, dry summers, and short, mild, relatively wet winters, also known as Mediterranean climate, while inland areas experience more extreme temperatures and little precipitation. Storms that have the potential to produce significant amounts of precipitation and flooding are extra-tropical cyclones of North Pacific origin, which normally occur from December through March. As the large winter

storms move south over the ocean, they encounter colder air masses and the orographic effect of the mountains, producing widespread precipitation. These storms often last for several days. In addition to the extra-tropical cyclones, the SCAG region receives thunderstorms, which can occur at any time of the year. Comparatively, thunderstorms cover small areas, but result in high-intensity precipitation, usually lasting for shorter periods. Consequently, thunderstorms can produce flash flooding, which are more common than widespread flooding within the region. **Table 3.13-1** shows annual total precipitation throughout the SCAG region.

TABLE 3.13-1: AVERAGE TOTAL PRECIPITATION FOR SELECTED AREAS WITHIN THE SCAG REGION

	Inches												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Los Angeles (*Civic Center*) (1914-2007)	3.15	3.44	2.45	1.05	0.26	0.06	0.01	0.06	0.27	0.44	1.29	2.36	14.84
Mountain Pass (1955-2007)	0.92	0.91	0.89	0.48	0.27	0.20	1.04	1.23	0.59	0.54	0.68	0.63	8.38
El Centro (1948-2006)	0.46	0.32	0.24	0.06	0.02	0.00	0.09	0.34	0.24	0.29	0.19	0.34	2.59
Redlands (1927-2007)	2.51	2.72	2.22	1.15	0.41	0.10	0.07	0.17	0.33	0.66	1.12	1.87	13.33
Ventura (1948-2007)	2.96	3.40	2.55	0.97	0.23	0.03	0.01	0.02	0.23	0.42	1.62	2.14	14.58
Laguna Beach (1928-2007)	2.52	2.82	2.07	0.99	0.25	0.11	0.02	0.07	0.26	0.49	1.24	1.93	12.77
Eagle Mountain (1948-2007)	0.50	0.44	0.34	0.09	0.05	0.03	0.26	0.70	0.38	0.23	0.19	0.41	3.62

SOURCE: Western Regional Climate Center, 2001, available at: *www.wrcc.dri.edu*, accessed August 9, 2011.

Most precipitation within the SCAG region occurs as rainfall, although snowfall is common at higher elevations. Historically, the region receives most of its rainfall during the month of January and the least of its rainfall during the month of June. For the entire region, annual rainfall can range from 2 to 5 inches inland, 10 to 18 inches on the coastal plains, and 20 to 40 inches in the mountains. The region is also subject to multi-year cycles of wet (El Niño) and dry (La Niña) weather.

Hydrologic Regions

The Department of Water Resources (DWR) has divided the state into ten hydrologic regions, corresponding to the State's major water drainage basins. Of the ten hydrologic regions, four are – in whole or in part – within the SCAG region: Central Coast (part of Ventura County), South Lahontan (parts of Los Angeles and San Bernardino counties), South Coast (Orange County, along with parts of Los Angeles, Ventura, San Bernardino, and Riverside counties), and Colorado River (parts of Imperial, Riverside, and San Bernardino counties). These four regions are described below.

Central Coast Hydrologic Region. The Central Coast Hydrologic Region is located, as its name implies, along the central coast of California, extending from Southern San Mateo County in the north to Santa Barbara in the south and from the Pacific Ocean in the west to the edge of the Central Valley in the east. It includes all of Santa Cruz, Monterey, San Luis Obispo, and Santa Barbara counties, and parts of San Benito, San Mateo, Santa Clara, and Ventura counties. The most significant geological features are the Coast Range and the Santa Barbara Coastal Plain.

The Coastal Branch California Aqueduct – part of the SWP – brings approximately 32,000 acre-feet of water annually into Southern California through the Central Coast Region.[1] This hydrologic region currently uses more water resources than it gains throughout the year. Groundwater is the major source of water in the region, which experiences annual reductions in its groundwater storage. The region, therefore, battles the threat of saltwater intrusion into its aquifers, a problem documented as far back as the 1930s.[2]

South Lahontan Hydrologic Region.[3] The South Lahontan Hydrologic Region is located in the southeast portion of California and is characterized by desert, sand dunes, and dry lakes. The northern half of the region includes Mono Lake, Owens Valley, Panamint Valley, Death Valley, and the Amargosa River Valley. The Mojave Desert occupies the southern half of the hydrologic region, and is characterized by many small mountain ranges and valleys with playas, or dry lakes. The southern half falls within the SCAG region in San Bernardino and Los Angeles counties.

The Los Angeles Aqueduct is the region's major water development feature. The initial 223-mile long aqueduct was completed by the Los Angeles Department of Water and Power (LADWP) and began diverting water from Owens Valley into the City of Los Angeles. The aqueduct was extended 115 miles in 1940 and 137-miles in 1970. The Los Angeles Aqueduct system passes through 12 hydropower plants on its way to Los Angeles. The annual energy generated is more than 1 billion kilowatt-hours (enough to supply the energy demand of approximately 220,000 homes).

As shown in **Table 3.13-2**, five water agencies in the southwest portion of this region have contracts with the State Water Project (SWP) for a total of about 220,000 acre-feet of surface water annually. The East Branch of the SWP is used to recharge groundwater in the Mojave River Valley.

TABLE 3.13-2: WATER AGENCIES IN THE SOUTH LAHONTAN HYDROLOGIC REGION

Water Agency	State Water Project Description
Mojave Water Agency (MWA)	MWA relies predominantly from groundwater. It also receives water as one of the 29 SWP contractors, per their integrated Regional Water Management Plan update (IRWMP).
Antelope Valley East Kern Water Agency (AVEK)	Provides water to 5 major municipal agencies and 16 smaller water service agencies.
Palmdale Water District (PWD) and Little Rock Irrigation District (LRID)	Littlerock Reservoir has 2,700 acre-feet capacity and provides water to LRID. Water from Littlerock Reservoir is released into PWD's Lake Palmdale (a 42,000 acre-foot lake reservoir).
Arrowhead Lake Association	Lake Arrowhead, owned by Arrowhead Lake Association is a 48,000 acre-foot reservoir providing recreational opportunities and water to Arrowhead Woods property owners.

SOURCE: DWR, State Water Project Analysis Office website, available at: *http://www.water.ca.gov/swpao/wsc.cfm*, accessed August 11, 2011.

South Coast Hydrologic Region.[4] The South Coast Hydrologic Region compromises the southwest portion of the state and is California's most urbanized and populous region. The topography includes a series of nearly flat coastal plains and valleys, broad interior valleys, and several mountains of low and moderate elevation. The region extends from the Santa Barbara-Ventura County line south to San Diego and the US international border with Mexico. Most of this area is within the SCAG region, including portions of Ventura, Orange, Los Angeles, San Bernardino, and Riverside Counties. Several prominent rivers exist

[1] DWR. California Water Plan Update. Central Coast Section, Volume 3, 2009, available at: *http://www.waterplan.water.ca.gov/docs/cwpu2009/0310final/v3_centralcoast_cwp2009.pdf*, accessed August 10, 2011.

[2] *Ibid.*

[3] DWR. California Water Plan Update. South Lahontan Section, Volume 3, 2009, available at: *http://www.waterplan.water.ca.gov/docs/cwpu2009/0310final/v3_southlahontan_cwp2009.pdf*, accessed August 10, 2011.

[4] DWR, California Water Plan Update, South Coast Section, Volume 3, 2009, available at: *http://www.waterplan.water.ca.gov/docs/cwpu2009/1009prf/3-sc_pre-final_pdf_13oct09.pdf*, accessed August 10, 2011.

within the region including Ventura River, Santa Clara River, Los Angeles River, San Gabriel River, Santa Ana River, San Jacinto Rivers, and Santa Margarita River.

Water Supply and Use in the South Coast Hydrologic Region. The region has a diverse mix of both local and imported water supply sources. Local water sources include water recycling, groundwater storage and conjunctive use, conservation, brackish water desalination, water transfer and storage, and infrastructure enhancements. The region imports water through the SWP, the Colorado River Aqueduct (CRA), and the Los Angeles Aqueduct (LAA). These resources allow the region flexibility in managing supplies and resources in wet and dry years.

The Metropolitan Water District of Southern California (MWD) wholesales the water to a consortium of 26 member agencies, including 14 cities, 11 municipal water districts, and one county authority that serves nearly 19 million people living in six counties stretching from Ventura to San Diego. MWD imported an average of 1 million acre-feet of water per year from the SWP from 1995 to 2010, and just under 1 million acre-feet per year from the CRA during the same time period. [5]

Colorado River Hydrologic Region.[6] The Colorado River Hydrologic Region covers the southeast portion of California and contains 12 percent of the state's land area. The Colorado River, the main tributary of this hydrologic region, forms most of the region's eastern boundary and international boundary with Mexico. The region includes all of Imperial County, the eastern two-thirds of Riverside County, the southeastern one-third of San Bernardino County and about one-fourth of San Diego County. It has a variety of arid desert terrain that includes many bowl-shaped valleys, broad alluvial fans, sandy washes, and hills and mountains.

Water Supply and Use in the Colorado River Hydrologic Region. About 85 percent of the region's urban and agricultural water supply comes from surface water deliveries from the Colorado River. Water from the river is delivered to the region via the All American and Coachella canals, local diversions, and the Colorado River Aqueduct by means of an exchange for SWP water. The Colorado River is an interstate and international river whose use is apportioned among the seven Colorado River Basin states and Mexico by a complex body of statues, decrees, and court decisions known collectively as the "Law of the River." Local surface water, groundwater, and the SWP provide the reminder of water to the region. In addition, many of the alluvial valleys in the regions are underlain by groundwater aquifers that are the sole source of water for many local communities. However, some alluvial valleys contain groundwater of such poor quality it is not suitable for potable uses.

Surface Hydrology

Surface water hydrology refers to surface water systems, including watersheds, floodplains, rivers, streams, lakes and reservoirs, and the inland Salton Sea.

Watersheds. Watersheds refer to areas of land, or basin, in which all waterways drain to one specific outlet, or body of water, such as a river, lake, ocean, or wetland. Watersheds have topographical divisions such as ridges, hills or mountains. All precipitation that falls within a given watershed, or basin, eventually drains into the same body of water.

There are 20 major watersheds within the SCAG region (**Map 3.13-3** located in Chapter 8.0 (Maps)), all of which are outlined and shaped by the various topographic features of the region. Given the physiographic characteristics of the SCAG region, most of the watersheds are located along the Transverse and Peninsular Ranges, and only a small number are in the desert areas (Mojave and Colorado Desert). Below is a summary

[5] MWD, Regional Urban Water Management Plan, November 2010.
[6] DWR, California Water Plan Update, Colorado River Section, Volume 3, 2009, available at: *http://www.waterplan.water.ca.gov/docs/cwpu2009/1009prf/3-rr_cr_pre-final_pdf_13oct09.pdf*, accessed August 10, 2011.

of each of the major watersheds, by county, with their corresponding Hydrologic Unit Code (HUC), which is assigned by the US Geological Survey.

Antelope-Fremont Valleys Watershed (HUC 18090206). The Antelope-Fremont Valley Watershed straddles Kern and Los Angeles County, and is bordered on the southwest by the San Gabriel Mountains, on the northwest by the Tehachapi Mountains, and on the east by a series of hills and buttes that follow the San Bernardino County line. Numerous streams originate in the mountains and foothills surrounding the valley and flow across the valley floor before eventually pooling in the dry lakes adjacent to the county line. It's located in the South Lahontan Hydrologic region.

The watershed drains a total of 12,000 square miles within Los Angeles County. Three of the major tributaries are Big Rock Creek and Little Rock Creek that run from the San Gabriel Mountains and Oak Creek that runs from the Tehachapi Mountains. The Los Angeles Aqueduct also runs 180 miles through the watershed. Reservoirs include the California Aqueduct, Fairmont Reservoir, and Littlerock Reservoir. Major cities within the Los Angeles County portion of the watershed include Lancaster and Palmdale.

Los Angeles River Watershed (HUC 18070105). The Los Angeles River watershed is bounded by the Santa Susanna Mountains to the west, the San Gabriel Mountains to the north and east, and the Santa Monica Mountains and Los Angeles coastal plain to the south. The Los Angeles River is born at the confluence of Bell Creek and Calabasas Creek in the San Fernando Valley. It drains eastward from its headwaters to the northern corner of Griffith Park where the channel then turns southward through the rocky bottleneck of Glendale Narrows. After crossing the coastal plain, the river finally drains into San Pedro Bay near Long Beach. The drainage area of Los Angeles Watershed is 834 square miles and the entire watershed falls within the South Coast Hydrologic Region.

Major tributaries of the watershed are Burbank Western Channel, Pacoima Wash, Tujunga Wash, and Verdugo Wash in the San Fernando Valley and the Arroyo Seco, Compton Creek, and Rio Hondo south of the Glendale Narrows. There are numerous lakes and reservoirs in the watershed, including Big Tujunga Reservoir, Chatsworth Reservoir, Encino Reservoir, Echo Park Lake, Los Angeles Reservoir, and Silverlake Reservoir. The upper 57 percent of the watershed is covered by forest and open space, while the remaining 43 percent is highly developed with residential and urban use. Major cities within the watershed include Long Beach and Los Angeles.

San Gabriel River Watershed (HUC 18070106). The San Gabriel Watershed lies mostly in Los Angeles County. It is bounded by the San Gabriel Mountains to the north, Puente-Chino Hills to the southeast, the division of the Los Angeles River from the San Gabriel River to the west, and the Pacific Ocean to the south. From the mouth of San Gabriel Canyon in the city of Azusa, the San Gabriel River flows south across the San Gabriel Valley and passes through Whittier Narrows, a natural gap in the hills that form the southern boundary of the San Gabriel Valley. It continues across the Pacific Coastal Plain, through the cities of Pico Rivera, Downey, Bellflower, and Lakewood to eventually meet the Pacific Ocean. Geology of the San Gabriel Valley creates an unusual flow pattern that keeps the San Gabriel River along the western edge of the watershed for most of its length. Major tributaries are San Jose Creek, San Dimas Creek, and Walnut Creek. The watershed falls within the South Coast Hydrologic Region.

The watershed drains 640 square miles. Twenty-six percent of the watershed is developed, leaving sixty-four percent as open space. The river system runs through lands in the Angeles National forest, as well as highly urbanized lands in the San Gabriel, Walnut, and Pomona Valleys. Major cities include Covina, Pomona, Whittier, Los Angeles, and Long Beach.

Santa Monica Bay Watershed (HUC 18070104). The majority of Santa Monica Bay Watershed is in Los Angeles County, and contained within the South Coast Hydrologic Region. In the north, the watershed reaches eastward from the Santa Monica Mountains to downtown Los Angeles. From there, it extends south

and west across the Los Angeles plain to include the area east of Ballona Creek and north of the Baldwin Hills. South of Ballona Creek the natural drainage area is a narrow strip of wetlands between Playa del Rey and Palos Verdes. The watershed is comprised of many sub-watersheds that cover broad alluvial valleys, coastal dunes, coastal mountains, and a number of deep and narrow canyons that flow to the Pacific Ocean. The major sub-watersheds include Ballona Creek, Malibu Creek, Topanga Canyon Creek, and Solstice Creek Watersheds. The total drainage area is 414 square miles. Santa Monica Bay Watershed is one of the nation's most highly urbanized watersheds. Major cities within the watershed include Agoura Hills, Calabasas, Malibu, Los Angeles, Culver City, Beverly Hills, Inglewood, Santa Monica, and West Hollywood.

Newport Bay Watershed (HUC 18070204). The Newport Bay Watershed is sandwiched between the San Joaquin Hills to the north and the Santiago Hills to the south, which force surface flow onto the central, flat Tustin plain. The Pacific Ocean comprises 13.5 miles of the watershed's western border. Coastal foothills accent the alluvial and coastal plains between the two mountain ranges. In total, the watershed drains 150 square miles, which encompasses all water draining to Newport Bay. Peters Canyon Wash, San Diego Creek, and Santa Ana Delhi Channel are the watershed's major tributaries. Newport Bay Watershed falls within the South Coast Hydrologic Region.

Land in the Newport Bay Watershed is highly developed. Forty-seven percent of the landscape is urban, four percent agriculture, and forty-nine percent open space. Major cities include Santa Ana, Tustin, Irvine, Costa Mesa, and Newport Beach.

Seal Beach - Westminster Watershed (HUC 1807020). The Westminster Watershed lies on a flat coastal plain in the northwestern corner of Orange County. Three main tributaries drain a total of 74 square miles in the watershed. The Los Alamitos Channel drains into the San Gabriel River, the Bolsa Chica Channel empties into the Anaheim Bay-Huntington Harbor complex, and the East Garden Grove-Wintersburg Channel drains through Bolsa Bay into Huntington Harbor. The Seal Beach – Westminster Watershed is located in the South Coast Hydrologic Region.

The Westminster Watershed is almost entirely urbanized with residential and commercial development. The watershed comprises portions of the cities of Anaheim, Cypress, Fountain Valley, Garden Grove, Huntington Beach, Los Alamitos, Santa Ana, Seal Beach, Stanton, and Westminster.

Aliso-San Onofre Watershed (HUC 18070301). The Aliso-San Onofre Watershed lies within Orange County, in the South Coast Hydrologic Region. The major waterway is Aliso Creek, which drains to the Pacific Ocean. Aliso Creek is one of three significant waterbodies in the watershed, in addition to Lake Mission Viejo and San Juan Creek. This watershed is highly urbanized, with over fifty percent of the land area classified as urban.

Mojave Watershed (HUC 18090208). The Mojave Watershed, comprised of high desert, mountains, and valleys, is located entirely within San Bernardino County and within the South Lahontan Hydrologic Region. It drains a total of 1,600 square miles. The San Bernardino, Granite, and Barstol Mountains form the southwestern borders of the watershed. Mountains in this region are the highest and include Butler Peak, which is the highest point with an elevation of 8,500 feet. The San Bernardino Mountains are the headwaters for the Mojave River system which is born of Deep Creek and West Fork, the two perennial tributaries to the Mojave River. The Mojave River traverses the watershed for 120 miles until its terminus at Soda Lake and Silver Dry Lake. Flow is from the southwest to the northeast across the watershed.

Land in the Mojave Watershed is largely recreational areas and rangeland. A small amount of the land is irrigated agricultural land and 'rural urban' areas. Major population centers in the watershed include Victorville, Hesperia, Apple Valley, and Adelanto.

Southern Mojave Watershed (HUC 18100100). The Southern Mojave Watershed lies in San Bernardino and Riverside Counties and within the Colorado River Hydrologic Region. It is bordered by a mountainous region of the Mojave Watershed to the north. The watershed is comprised of mountains, valleys, and dry lakes. A significant geographical feature of the region is the Salton Trough, which contains the Salton Sea and Imperial and Coachella Valleys. The two valleys are separated by the Salton Sea, which covers the lowest area of the depression. Major tributaries include Antelope Creek, Arrastre Creek, Homer Wash, and Pipes Canyon Creek.

Santa Ana River Watershed (HUC 18070203). The Santa Ana River Watershed includes much of Orange County, the northwestern corner of Riverside County, the southwestern corner of San Bernardino County, and a small portion of Los Angeles County, draining a total of 2,065 square miles. The Watershed is located within the South Coast Hydrologic Region. The watershed is bounded on the south by the San Jacinto Watershed, on the east by the Salton Sea and Southern Mojave watersheds, and on the north and west by the Mojave and San Gabriel watersheds. The highest elevations in the watershed occur in the San Bernardino Mountains at San Gorgonio Peak at 11,485 feet and the eastern San Gabriel Mountains at Mt. Baldy at 10,080 feet. Surface waters start in this mountainous zone and flow northeast to southwest. Further downstream, the Santa Ana Mountains and the Chino Hills form a topographic high before the river flows onto the Coastal Plain in Orange County and outlets into the Pacific Ocean in Huntington Beach. Major tributaries to the Santa Ana River include San Timoteo Creek and Santiago Creek.

Santa Ana Watershed is home to the most developed portion of Orange County and much of the built-up portions of Riverside and San Bernardino Counties. Major cities include Santa Ana, Rancho Cucamonga, Corona, and San Bernardino.

San Jacinto Watershed (HUC 18070202). The San Jacinto River Watershed covers approximately 770 square miles and is located approximately 80 miles southeast of Los Angeles. It extends from the San Jacinto Mountains in the north and east to Lake Elsinore in the west. Most of the Watershed (99.75 percent) falls within Riverside County, while the remaining portion extends into an undeveloped portion of Orange County.

Calleguas Creek Watershed (HUC 18070103). Calleguas Creek and its tributaries are located in southeast Ventura County and a small portion of western Los Angeles County. The watershed falls within the South Coast Hydrologic Region. Calleguas Creek drains an area of approximately 343 square miles from the Santa Susana Pass in the east to Mugu Lagoon in the southwest. The watershed drains from the mountains in the northeast part of the watershed toward the southwest where it flows through the Oxnard Plain before emptying into the Pacific Ocean through Mugu Lagoon. The Santa Susana Mountains, South Mountain, and Oak Ridge form the northern boundary of the watershed; the southern boundary is formed by the Simi Hills and Santa Monica Mountains.

The watershed is characterized by three major sub-watersheds: the Arroyo Simi/Las Posas in the north, Conejo Creek in the south, and Revolon Slough in the west. Major tributaries of Callegua Creek include Arroyo Simi, Arroyo Conejo, and Arroyo Santa Rosa. The watershed includes the cities of Simi Valley, Moorpark, Thousand Oaks, and Camarillo. Most of the agriculture is located in the middle and lower watershed with the major urban areas (Thousand Oaks and Simi Valley) located in the upper watershed. The current land use in the watershed is approximately 26 percent agriculture, 24 percent urban, and 50 percent open space.

Santa Clara River Watershed (HUC 18070102). Santa Clara River and its tributaries run through Ventura County and the northwestern part of Los Angeles County, and are located in the South Coast Hydrologic Region. The portion of the watershed within Los Angeles County is referred to as Upper Santa Clara and the portion within Ventura County is referred to as Lower Santa Clara. Santa Clara River drains an area of 1,634 square miles from the mountains in northern Los Angeles County to the Pacific Ocean. The watershed drains

from Pacifico Mountain in the San Gabriel Mountains westward through the Angeles National Forest System before emptying into the Pacific Ocean near the City of Ventura. Ninety percent of the watershed consists of rugged mountains. The remainder of the watershed consists of valley floor and coastal plains.

Land use in the Santa Clara Watershed is 62 percent open space, 29 percent agriculture, and 9 percent urban. Major cities include Acton, Santa Clarita, Fillmore, Santa Paula, Ventura, and Oxnard.

Ventura River Watershed (HUC 18070101). Ventura River Watershed lies entirely in Ventura County. Rugged mountains comprise the upper basin and give way to flat valleys in the lower downstream areas. Nearly half of the watershed is in Los Padres National Forest. Ventura Watershed drains 223 square miles, from its headwaters in the mountains to its outlet in the Pacific Ocean. The Ventura River bisects the watershed, flowing from north to south. Major tributaries are Matilija Creek, North Fork Matilija Creek, San Antonio Creek, Coyote Creek, and Cañada Larga. Lake Casitas and Matijila Reservoir are two major reservoirs within the watershed. The Ventura River watershed falls within the South Coast Hydrologic Region.

Land in Ventura Watershed is largely open space with little urbanization. Eighty-seven percent is open space, ten percent agriculture, and three percent urban. Major communities are Ojai, Oak View, and the western portion of the City of San Buenaventura.

Lower Colorado Watershed (HUC 15030107). The Lower Colorado Watershed straddles the border between Imperial County in California and Yuma County in Arizona, and extends into the State of Sonora in northern Mexico.

The lower Colorado River is heavily dammed for agricultural, municipal, and industrial uses, including the Imperial, Laguna, and Morelos Dams. The Imperial Dam provides water for the All American Canal, which carries over five-million acre-feet of water into California every year, mostly for agricultural uses.

Salton Sea Watershed (HUC 18100200). Immediately west of the Lower Colorado Watershed, Salton Sea Watershed extends from just north of the Salton Sea, in Riverside County, to the Mexicali Valley, near the US-Mexico border, in Imperial County. This watershed makes up the lower part of the Coachella Valley, bordered by mountains to the east and west, and extending south to the Colorado Delta in the Sea of Cortez. The main geographic feature in this watershed is California's largest lake, the Salton Sea, an inland saltwater lake approximately 380 square miles in size.

In 2001, the Imperial Valley Irrigation District, the largest recipient of Colorado River water in California, agreed to a plan to transfer up to 200,000 acre-feet of water per year to San Diego for municipal water uses.

Imperial Reservoir Watershed (HUC 15030104). North of the Lower Colorado Watershed is Imperial Reservoir Watershed, which lies on both sides of the California-Arizona border along the Colorado River. It extends north to Lake Havasu, created by the construction of Parker Dam, which was completed in 1938.

Floodplains. Much of the SCAG region's urbanized area lies within alluvial fan floodplains. Since the region is so mountainous, development often occurs in the valleys, and newer development extends into the foothills of those mountains. Floodplains in Southern California are a unique hazard area; although flooding from rain-swollen rivers can occur in valley bottoms, a more common floodplain hazard is debris flow. Debris flows are common in mountain foothill areas, especially after fire and heavy rain events, when wet, heavy soils and rock slide down steep slopes and into valleys below. Areas with a history of such slides can often be identified by sloping, fan-shaped landforms at the base of mountains and hillsides.

Rivers. Because the climate of Southern California is predominantly arid, many of the natural rivers and creeks are intermittent or ephemeral, drying up in the summer or flowing only after periods of precipitation.

For example, annual rainfall amounts vary depending on elevation and proximity to the coast. Some waterways such as Ballona Creek and the Los Angeles River maintain a perennial flow due to agricultural irrigation and urban landscape watering.

Major natural streams and rivers in the SCAG region include the Ventura River, Santa Clara River, Los Angeles River, San Gabriel River, Santa Ana River, San Jacinto River, and upstream portions of the Santa Margarita River.

The Ventura River is fed by Lake Casitas on the western border of Ventura County and empties out into the ocean. It is the northern-most river system in Southern California, supporting a large number of sensitive aquatic species. Water quality decreases in the lower reaches due to urban and industrial impacts.

The Santa Clara River flows through the center of Ventura County and remains in a relatively natural state. Threats to water quality include increasing development in floodplain areas, flood control measures such as channeling, erosion, and loss of habitat.

The Los Angeles River is a highly disturbed system due to the flood control features along much of its length. Due to the high urbanization in the area around the Los Angeles River, runoff from industrial and commercial sources as well as illegal dumping contribute to reduce the channel's water quality.

The San Gabriel River is similarly altered with concrete flood control embankments and impacted by urban runoff.

The Santa Ana River drains the San Bernardino Mountains, cuts through the Santa Ana Mountains, and flows onto the Orange County coastal plain. Recent flood control projects along the river have established reinforced embankments for much of the river's path through urbanized Orange County.

The Santa Margarita River begins in Riverside County, draining portions of the San Jacinto Mountains and flowing to the ocean through northern San Diego County.

Complete lists of surface water resources within the SCAG region, along with the beneficial uses associated with them, are contained in each of the five Basin Plans prepared by the Regional Water Quality Control Boards of the region.[7,8,9,10,11]

Lakes and Reservoirs. Since Southern California is a semi-arid region, many of its lakes are drinking water reservoirs, created either through damming of rivers, or manually dug and constructed. Reservoirs also serve as flood control for downstream communities. Some of the most significant lakes, including reservoirs, in the SCAG region are Big Bear Lake, Lake Arrowhead, Lake Casitas, Castaic Lake, Pyramid Lake, Lake Elsinore, Diamond Valley Lake, and the Salton Sea.

Big Bear Lake is a reservoir in San Bernardino County, in the San Bernardino Mountains. It was created by a granite dam in 1884, which was expanded in 1912, and holds back approximately 73,000 acre-feet of water. The lake has no tributary inflow, and is replenished entirely by snowmelt. It provides water for the community of Big Bear, as well as nearby communities.

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[7]Central Valley Basin Plan, available at: *http://www.swrcb.ca.gov/rwqcb5/water_issues/basin_plans/*, accessed August 9, 2011.
[8]Lahontan Basin Plan, available at: *http://www.swrcb.ca.gov/lahontan/water_issues/programs/basin_plan/*, accessed August 9, 2011.
[9]Los Angeles Basin Plan, available at: *http://www.swrcb.ca.gov/rwqcb4/water_issues/programs/basin_plan/*, accessed August 9, 2011.
[10]Santa Ana Basin Plan, available at: *http://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/index.shtml*, accessed August 9, 2011.
[11]Colorado River Basin Plan, available at: *http://www.swrcb.ca.gov/rwqcb7/*, accessed August 9, 2011.

Lake Arrowhead is also in San Bernardino County, at the center of an unincorporated community also called Lake Arrowhead. The lake is a man-made reservoir, with a capacity of approximately 48,000 acre-feet. In 1922, the dam at Lake Arrowhead was completed, with the intention of turning the area into a resort for wealthy Angelinos. It is now used for recreation and as a potable water source for the surrounding community.

Lake Casitas is in Ventura County, and was formed by the Casitas Dam on the Coyote Creek just before it joins the Ventura River. The dam, completed in 1959, holds back nearly 255,000 acre-feet of water. The water is used for recreation, as well as drinking water and irrigation.

Castaic Lake is on the Castaic Creek, and was formed by the completion of the Castaic Dam. The lake is in northwestern Los Angeles County. It is the terminus of the West Branch of the California Aqueduct, and holds over 323,000 acre-feet of water. Much of the water is distributed throughout northern Los Angeles County, though some is released into Castaic Lagoon, which feeds Castaic Creek. The creek is a tributary of the Santa Clara River.

Pyramid Lake is just above Castaic Lake, and water flows from Pyramid into Castaic through a pipeline, generating electricity during the day. At night, when electricity demand and prices are low, water is pumped back up into Pyramid Lake. Pyramid Lake is on Piru Creek, and holds 180,000 acre-feet of water.

Lake Elsinore is in the City of Lake Elsinore, in Riverside County. The lake has dried and up and been replenished throughout the last century, it is now managed to maintain a consistent water level, with outflow piped into the Temescal Canyon Wash.

Diamond Valley Lake is Southern California's newest and largest reservoir. Located in Riverside County, it was a project of the Metropolitan Water District (MWD) to expand surface storage capacity in the region. A total of three dams were required to create the lake. Completed in 1999, it was full by 2002, holding 800,000 acre-feet of water, effectively doubling MWD's surface water stores in the region. The lake is connected to the existing water infrastructure of the SWP. The lake is situated at approximately 1,500 feet above sea level, well above most of the users of the lake's water; this enables the lake to also provide hydroelectric power, as water flows through the lowest dam.

The Salton Sea is California's largest lake, nearly 400 square miles in size. The basin is over 200 feet below sea level, and has flooded and evaporated many times over, when the Colorado overtops its banks during extreme flood years. This cycle of flooding and evaporation has re-created the Sea several times over at least the last thousand years. Its most recent formation occurred in 1905 after an irrigation canal was breached and the Colorado River flowed into the basin for 18 months, creating the current lake.

The principle inflow to the Sea is from agricultural drainage, which is high in dissolved salts; approximately four million tons of dissolved salts flow into the Sea every year. The evaporation of the Sea's water, plus the addition of highly saline water from agriculture, has created one of the saltiest bodies of water in the world. The Sea has been a highly successful fishery and is a habitat and migratory stopping and breeding area for 380 different bird species; however, the high, and ever-increasing, salinity of the Sea is a continual challenge for the fish and birds that inhabit it.

The 2001 agriculture-to-urban water transfer agreement between the Imperial Valley Irrigation District and San Diego will have significant implications for the Salton Sea, and the watershed. The reduction in agricultural water flowing into the Sea will significantly lower water levels, shrinking the overall size of the Sea.

The major surface waters in this section are presented in **Table 3.13-3**, as well as shown on **Map 3.13-4** located in Chapter 8.0 (Maps).

TABLE 3.13-3: MAJOR SURFACE WATERS

Wetlands	Rivers, Creeks, and Streams	Lakes and Reservoirs
LOS ANGELES BASIN (REGION 4)		
Ventura River Estuary	Sespe Creek	Lake Casitas
Santa Clara River Estuary	Piru Creek	Lake Piru
McGrath Lake	Ventura River	Pyramid Lake
Ormond Beach Wetlands	Santa Clara River	Castaic Lake
Mugu Lagoon	Los Angeles River	Bouquet Reservoir
Trancas Lagoon	Big Tahunga Canyon	Los Angeles Reservoir
Topanga Lagoon	San Gabriel River	Chatsworth Reservoir
Los Cerritos Wetlands		Sepulveda Reservoir
Ballona Lagoon		Hansen Reservoir
Los Angeles River		San Gabriel Reservoir
Ballona Wetlands		Morris Reservoir
		Whittier Narrows Reservoir
		Santa Fe Reservoir
LAHONTAN BASIN (REGION 6)		
	Mojave River	Silver Lake
	Amargosa River	Silverwood Lake
		Mojave River Reservoir
		Lake Arrowhead
		Soda Lake
COLORADO RIVER BASIN (REGION 7)		
	Colorado River	Lake Havasu
	Whitewater River	Gene Wash Reservoir
	Alamo River	Copper Basin Reservoir
	New River	Salton Sea
		Lake Cahulla
SANTA ANA BASIN (REGION 8)		
Hellman Ranch Wetlands	Santa Ana River	Prado Reservoir
Anaheim Bay	San Jacino River	Big Bear Lake
Bolsa Chica Wetlands		Lake Perris
Huntington Wetlands		Lake Matthews
Santa Ana River		Lake Elsinore
Laguna Lakes		Vail Lake
San Juan Creek		Lake Skinner
Upper Newport Bay		Lake Hemet
San Joaquin Marsh		
Prado Wetlands		
SAN DIEGO BASIN (REGION 9)		
	Santa Margarita River	Vail Lake
	Aliso Creek	Skinner Reservoir

SOURCES: California State Water Resources Control Board, *Regional Board Water Quality Control Plans (Basin Plans)*, available at: http://www.swrcb.ca.gov/plans_policies/, accessed August 11, 2011.

Groundwater Hydrology

Groundwater is the part of the hydrologic cycle representing underground water sources. Groundwater is present in many forms: in reservoirs, both natural and constructed, in underground streams, and in the vast movement of water in and through sand, clay, and rock beneath the earth's surface. The place where groundwater comes closest to the surface is called the water table, which in some areas may be very deep, and in others may be right at the surface. Groundwater hydrology is, therefore, connected to surface water hydrology, and cannot be treated as a separate system. One example of this is surface streams that are partly filled by groundwater. When that groundwater is pumped out and removed from the system, the stream levels will fall, or even dry up entirely, even though no water was removed from the stream itself.

Groundwater represents most of the SCAG region's fresh water supply, making up approximately 30 percent of total water use, depending on precipitation levels.[12] Groundwater basins are replenished mainly through infiltration – precipitation soaking into the ground and making its way into the groundwater. Two threats to the function of this system are increases in impervious surface and overdraft.

Impervious surface decreases the area available for groundwater recharge, as precipitation runoff flows off of streets, buildings, and parking lots directly into storm sewers, and straight into either river channels or into the ocean. This prevents the natural recharge of groundwater, effectively removing groundwater from the system without any pumping. Impervious surface also deteriorates the quality of the water, as it moves over streets and buildings, gathering pollutants and trash before entering streams, rivers, and the ocean.

Overdraft is the condition where the rate of water withdrawal exceeds the rate of water recharge in a particular basin over a period of time. Within the SCAG region, the Ventura Central Basin has been identified as being in a critical condition of overdraft.[13] In the late 1940s, increased groundwater use for agriculture and related processing operations in the Oxnard Plain reduced groundwater elevations, resulting in seawater intrusion into Ventura County as far as Moorpark and Fillmore. In an effort to provide alternatives to groundwater extraction, water is diverted from the Santa Clara River and provided for agricultural use. The water is also used as groundwater recharge to help offset groundwater demand and prevent further reduction of the water table. Currently, groundwater extractions approximately equal recharge, and the saltwater intrusion has been halted.

To prevent seawater intrusion in coastal basins in Orange County, recycled water is injected into the ground to form a mound of groundwater between the coast and the main groundwater basin. In Los Angeles County, imported and recycled water is injected to maintain a seawater intrusion barrier.

A comprehensive assessment of overdraft in California groundwater basins has not been conducted since 1980. The most recent (2003) DWR report on California's groundwater found that in most cases, there is insufficient quantitative information to identify overdrafted groundwater basins.[14] The report encourages local groundwater managers and DWR to seek funding and work cooperatively to evaluate groundwater basins for overdraft. The report recommends that local agencies take the lead in collecting and analyzing data to understand groundwater basin conditions, and points out that much of the data are needed by the agencies to effectively manage groundwater. Despite the lack of local data, DWR does provide overdraft estimates for the State as a whole, which are on the order of one to two million acre-feet per year, during average precipitation years.

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[12]DWR, *California 's Groundwater - Bulletin 118*, Update 2003, available at: *http://www.water.ca.gov/pubs/groundwater/ bulletin_118/california's_groundwater__bulletin_118_-_update_2003_/bulletin118_entire.pdf*, accessed August 10, 2011.

[13]DWR, California Water Plan Update, South Coast Section, Volume 3, 2009.

[14]DWR, *California 's Groundwater - Bulletin 118*, Update 2003, available at: *http://www.water.ca.gov/pubs/ groundwater/b ulletin_118/california's_groundwater__bulletin_118_-_update_2003_/bulletin118 _entire.pdf*, accessed August 10, 2011.

The Natural Resources Defense Council issued a 2001 report that found California's groundwater resources face a serious long-term threat from contamination. Subsequent legislation required a comprehensive assessment of groundwater quality. Groundwater wells throughout the SCAG region are being studied for contaminants and the results can be accessed on the Internet.[15] A number of the wells have contaminants, but none exceed drinking water quality standards (i.e., primary standards for maximum contaminant loads).

Volatile organic compounds have created groundwater impairments in industrialized portions of the San Gabriel and San Fernando Valley groundwater basins, where some locations have been declared federal Superfund sites. Subsequently, perchlorate contamination was found in the San Gabriel Valley. As of 2003, $99 million had been spent removing contaminants from affected aquifers. The EPA continues to oversee installation of a groundwater cleanup system, components of which were installed beneath the cities of La Puente and Industry in 2006. Similar problems exist in the Bunker Hills subbasin of the Upper Santa Ana Valley groundwater basin. Perchlorate contamination has also been found in wells in the Rialto, Colton, and Fontana areas of San Bernardino County. Groundwater continues to be used as the predominant source of water supply in these areas.

The presence of contamination in the source water does not necessarily require the closure of a groundwater well. Water systems can implement water treatment accompanied by monthly monitoring for contaminants and/or may blend the problematic water with other "cleaner" water in order to reduce the concentration of the contaminants of concern in the water that is ultimately to be delivered to the end-users.

Water Demand and Supply

Water Demand. Water demand in California can generally be divided between urban, agricultural, and environmental uses. In the SCAG region, approximately 75 percent of potable water is provided from imported sources. Annual water demand fluctuates in relation to available supplies. During prolonged periods of drought, water demand can be reduced significantly through conservation measures, while in years of above average rainfall, demand for imported water usually declines. In 2000, a 'normal' year in terms of annual precipitation, the demand for water in the State was between approximately 82 and 83 million acre feet (maf).[16] Of this total, the SCAG region accounted for approximately 9.8 maf.[17]

The increase in California's water demand is due primarily to the increase in population. By employing a multiple future scenario analysis, the California Water Plan Update 2009 provides a growth range for future annual water demand. According to the California Water Plan Update 2009, statewide future annual water demands ranges from an increase of fewer than 1.5 maf for the Slow & Strategic Growth scenario, to an increase of about 10 maf under the Expansive Growth scenario by year 2050.[18] If SCAG maintains its share of 12 percent of the state's water demand, the SCAG region could be expected to require an additional 500,000 af by 2030.

Demographics, Land Use, and Water Use. Water demand is influenced not only by population size, but also by socio-economic characteristics, geographical distribution of the population, variation in precipitation levels, and water conservation practices. According to the SCAG State of the Region 2007, average per capita water usage can range from 170 gallons per day to 285 gallons per day.[19]

Water Conservation. The results of conservation in Los Angeles have been remarkable; the Los Angeles Department of Water and Power (LADWP) reported in their *2010 Urban Water Management Plan* that

[15] State Water Resources Control Board, GeoTracker GAMA website, available at: *http://geotracker.waterboards.ca.gov/gama/,* accessed August 10, 2011.
[16] DWR, California Water Plan Update, South Coast Section, Volume 1, 2009.
[17] *Ibid.*
[18] *Ibid.*
[19] SCAG, *The State of the Region 2007.*

"[a]verage water demands in the last five years from FY 2004/2005 to 2009/2010 are about the same as they were in FY 1980/81 despite the fact that over 1.1 million additional people now live in Los Angeles."[20]

Urban conservation measures include reducing landscape water use and installing low flow toilets and showerheads in new development. In September of 1991, during a state-wide drought, the MWD and other California water agencies signed a Memorandum of Understanding Regarding Urban Water Conservation Best Management Practices. Best Management Practices (BMPs) to conserve water in commercial, institutional, and industrial uses could further reduce demand by an estimated three to five percent. Encouragement of the use of native and drought-proof plants, increased water conservation credits, funding for innovative conservation ideas in industry, tiered water rate structures, "smart" irrigation controllers, and rebates for conservation hardware are all methods being implemented for increased conservation.[21]

In the winter of 2006/2007, the SCAG region received its lowest rainfall in recorded history. As a result of this drought, combined with ongoing drought in the Colorado River basin and unpredictability of future water supply due to global warming, conservation has shifted from a purely temporary measure to a long-term water management strategy. In 2007, the City of Long Beach passed a water conservation ordinance requiring individual reductions and behavioral changes regarding water use. According to the Long Beach Water Department, these measures are not intended to be temporary, but to form the basis for ongoing management of the city's water resources. Agricultural water conservation options are growing as irrigation techniques improve and as water transfer agreements create new pressures for more efficient water management and the growth of higher value and less water-intensive crops. As a result of these developments, DWR expects agricultural water consumption to decline materially by 2030 throughout the SCAG region.

On March 29, 2011, Governor Jerry Brown declared the "end of California's drought." However, Southern California is still experiencing a shortage of water. MWD lost 1/3 of its supply since 2009 due to court rulings limiting the pumping of water to protect and endangered species of fish, in addition to three years of below-average rainfall. As a result, all cities and agencies in Southern California were asked to reduce the amount of water they buy from MWD.

Water Supply

Local Water Supply. Local sources of water account for approximately 30 percent of the total volume consumed annually in the SCAG region.[22] Local sources include surface water runoff, groundwater, and water reclamation.

Local Surface Water (within each HU Region). The infiltration of surface runoff augments groundwater and surface water supplies. However, the regional water demand exceeds the current natural recharge of runoff water. The arid climate, summer drought, and increased impervious surface associated with urbanization contribute to this reduction in natural recharge. Urban and agricultural runoff often contains pollutants that decrease the quality of local water supplies. Runoff captured in storage reservoirs varies widely from year to year depending on the amount of local precipitation. On average, precipitation contributes approximately 38,000 acre-feet per year (afy) within the MWD service area (not including San Diego County).[23] Within the desert regions, the amount is considerably less, owing to climatic differences.

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[20]Los Angeles Department of Water and Power, 2010 Urban Water Management Plan, available at: *http://www.ladwp.com/ladwp/cms/ladwp001354.jsp*, accessed August 11, 2011.

[21]Metropolitan Water District, Annual Progress to the California State Legislature, 2004, available at: *http://www.mwdh2o.com/mwdh2o/pages/yourwater/sb60/archive/SB60_04.pdf*, accessed August 10, 2011.

[22]DWR, *2009 Water Plan Update,* Vol. 1.

[23]*Ibid.*

Local Groundwater. Groundwater represents most of the SCAG region's fresh water supply, making up approximately 30 percent of total water use, depending on precipitation levels.[24] This proportion increases to roughly 40 percent in dry years. The hydrologic regions vary in their dependence on groundwater for urban and agricultural uses. These differences are reflected in **Table 3.13-4**. **Map 3.13-5**, located in Chapter 8.0 (Maps), shows the groundwater basins within the SCAG region. The California Department of Water Resources estimates that the State has a groundwater overdraft of approximately 1 to 2 maf in average years.[25]

TABLE 3.13-4: GROUNDWATER DEPENDENCE IN THE SCAG REGION

Hydrologic Region	Percentage of the Total Urban and Agricultural Water Supply Provided by Groundwater
Central Coast /a/	83%
South Coast /b/	25%
South Lahonton /c/	65%
Colorado River /d/	11%

/a/ Includes part of Ventura County. The remainder is outside of the SCAG Region.
/b/ Includes Orange County, most of San Diego and Los Angeles counties, parts of Riverside, San Bernardino, Ventura, Kern and Santa Barbara counties.
/c/ Includes most of San Bernardino County, as well as Inyo, and parts of Mono, Kern and Los Angeles counties.
/d/ Includes all of Imperial County, most of Riverside, and parts of San Bernardino and San Diego counties.
SOURCE: DWR, *2009 Water Plan Update.*

Recent efforts to store recycled water and surplus water in groundwater basins for use during drought periods have proven successful. MWD has 10 projects with various water agencies for groundwater storage, resulting in approximately 421,900 af of added capacity per year.[26] A number of agencies within the region are also active in the recharge of surface water, including the Orange County Water District, Los Angeles County Department of Water and Power, Foothill Municipal Water District, San Bernardino County Water and Flood Control District, Coachella Valley Water District, the Water Replenishment District of Southern California, the San Gabriel Valley Municipal Water District, and the Calleguas Municipal Water District.

Reclaimed/Recycled Water (Regional Wastewater Management). Water reclamation and recycling involves the secondary, and sometimes tertiary, treatment of polluted groundwater and wastewater effluent. Recycled water is used for three main purposes: ocean outfall, in-stream discharge, or reuse. Recycled water may be reused for many purposes, including landscape irrigation, surface water amenities in public places, including parks, industrial processes, groundwater recharge, and non-potable interior uses such as toilets. The use of recycled water for these various purposes augments the region's local water supplies and reduces reliance on water imports. According to MWD, current recycled water projects, either planned or in operation in the SCAG region, will account for approximately 751,384 af annually by the year 2020.[27]

Recycled water could be a significant source of water for industry, which often needs highly processed, but non-potable water for industrial processes. Recycled water can also play a major role in replenishing saltwater intrusion barriers and other groundwater sources, but there are still significant hurdles to these uses with regards to health regulations, cost, and public acceptance of water recycling.

Storage. Water agencies in the region are also modifying existing reservoirs or creating new reservoirs to accommodate the expected future growth in water demand. MWD has completed filling Diamond Valley Lake near Hemet in Riverside County. This reservoir provides approximately 800,000 acre-feet of additional

[24]DWR, *California 's Groundwater - Bulletin 118*, Update 2003, available at: *http://www.water.ca.gov/pubs/groundwater/bulletin_118/california's_groundwater__bulletin_118_-_update_2003_/bulletin118_entire.pdf*, accessed August 10, 2011.
[25]DWR, California Water Plan Update, Volume 1, 2009.
[26]MWD, Regional Urban Water Management Plan, November 2010.
[27]Metropolitan Water District of Southern California, *The Regional Urban Water Management Plan 2010*, available at: *http://www.mwdh2o.com/mwdh2o/pages/yourwater/RUWMP/RUWMP_2010.pdf*, accessed August 11, 2011.

storage. In addition to surface storage, MWD is implementing various groundwater storage projects both within the SCAG area and in other areas of California. These "conjunctive use" projects store excess water during wet years in underground basins and can be accessed during dry years when surface water supplies are limited.

The SCAG region currently has more than 3.5 maf of storage capacity in all of its reservoirs; however, the anticipated increase in the region's population and growing uncertainty regarding water imports make increasing storage capacity a priority for the region. Increasing storage capacity can be a difficult process, with associated social and environmental impacts.

Imported Water. Imported sources of water (including the Colorado River Aqueduct, the State Water Project's California Aqueduct, and the Los Angeles Aqueduct) currently supply approximately 3 maf of water to the SCAG region annually, accounting for nearly two-thirds of the total water used in the region.[28]

Access to water in the SCAG region has traditionally been a potential constraint to growth, since local supplies alone are unable to support expansive development. Beginning with the completion of the Los Angeles Aqueduct (LAA) in 1913, the region has imported water from other parts of the state to supplement local supplies.

The All-American Canal and Coachella Canal were completed in 1940, supplying water to irrigation districts in the Imperial and Coachella Valleys for agricultural operations. The Colorado River Aqueduct, completed in 1941 by MWD, brings Colorado River water to the urban coastal areas, ranging from Ventura County to San Diego County. The California Aqueduct, completed in the 1970s, delivers water from the Sacramento Delta to MWD for distribution to retail agencies throughout Southern California. **Maps 3.13-6** through **3.13-8**, located in the map chapter, depict the areas served by these imported water supplies.

Colorado River. The Colorado River is a major source of water for Southern California, and is imported via the Colorado River Aqueduct, owned and operated by MWD.

Under water delivery contracts with the United States, California entities have enjoyed legal entitlements to Colorado River water since the early 20th century. There have been several compacts, treaties, and negotiations between the seven states that use Colorado River water, beginning with the 1922 Colorado River Compact. California was entitled to 4.4 maf, as well as half on any surplus, as defined by the Federal Department of the Interior. Typically, the river's surplus has allowed California entities to take an additional 800,000 af annually.

However, with increased urbanization in the Colorado River Basin states and limitation agreements between those states, surplus water for California was eliminated; the State will gradually return to its original allotment of 4.4 maf. Given these new terms, California water agencies are pursuing various strategies to offset this gradual, but certain loss of future water supply. Examples of these strategies include additional reservoir and storage agreements, new water transfers between agricultural and urban users, and more water conservation and recycling.[29]

State Water Project (SWP). The SWP supplies water to Southern California via the California Aqueduct, with delivery points in Los Angeles, San Bernardino, and Riverside counties. SWP was constructed and is managed by DWR, and is the largest state-owned, multi-purpose water project in the country. SWP has historically provided 25 to 50 percent of MWD's water, anywhere from 450,000 af to 1.75 maf annually.[30]

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[28] *Ibid.*
[29] *Ibid.*
[30] *Ibid.*

Southern California's maximum SWP yield is about 2.0 maf per year. SWP provides water to approximately 25 million people and irrigation water for roughly 750,000 acres of agricultural lands annually.

In 2007, a federal judge ordered the pumps that bring water from the Sacramento Bay Delta into Southern California be shut off, to protect an endangered fish species, the Delta smelt. Although pumping later resumed, it did so at only two-thirds of capacity, reducing by one-third the amount of water coming into Southern California through that system. It is unclear when, or even if, full capacity pumping will resume. The situation in the Bay Delta highlights the uncertainty and vulnerability of the region's dependence on imported water. Although the situation in the Delta will eventually be resolved, it will likely be a matter of decades before a satisfactory new system is in place.

Los Angeles Aqueduct. The Los Angeles Aqueduct, originally built in 1913, carries water 233 miles south from Owens Valley to Los Angeles. The original aqueduct project was extended in 1940 to the Mono Basin. The system was supplemented by a second project, parallel to the first, completed in 1970. These two aqueducts have historically supplied an average of approximately 256,000 af per year in normal years, and as little as 106,000 af per year in drier years.[31] Recent deliveries have been cut almost in half due to dwindling Sierra snowpack and a court decision restricting the amount of water that can be removed from the Owens Valley and Mono Basin in order to restore their damaged ecosystems.

Transfers. In an effort to diversify water sources and reduce reliance on specific water imports, water agencies have engaged in water transfer agreements. These contractual agreements, made with irrigation districts, reduce water use on agricultural lands either through agricultural conservation or fallowing land.[32] The water 'freed' by these reductions is transferred to a municipal water district, where it may be used or stored in aquifers for future use, a practice called *water banking*. Water banking is also done during wet years, when rainwater is collected and directed toward recharge facilities for future use.

Water Suppliers. The SCAG region is served by many water suppliers, both retail and wholesale; the largest of these agencies is MWD. Created by the California State legislature in 1931, MWD serves the urbanized coastal plain from Ventura to the Mexican border in the west to parts of the rapidly urbanizing counties of San Bernardino and Riverside in the east. It provides water to about 90 percent of the urban population of Southern California. MWD is comprised of 26 member agencies, 12 of which supply wholesale water to retail agencies and other wholesalers, and 14 of which are individual cities which directly supply water to their residents.[33] The Imperial Irrigation District (IID) in Imperial County, the largest irrigation district in the country, and the Palo Verde Irrigation District primarily serve agricultural users. A list of major water suppliers operating within the SCAG region is given in **Table 3.13-5**.

Water Quality

The quality of the SCAG region's surface waters, groundwater, and coastal waters are discussed below.

Surface Water. Surface water resources in the SCAG region include creeks and rivers, lakes and reservoirs, and the inland Salton Sea. Reservoirs serving flood control and water storage functions exist throughout the region. Because the climate of Southern California is predominantly arid, many of the natural rivers and creeks are intermittent or ephemeral, drying up in the summer or flowing only in reaction to precipitation. For example, annual rainfall amounts vary depending on elevation and proximity to the coast. Some waterways such as Ballona Creek and the Los Angeles River maintain a perennial flow due to agricultural irrigation and urban landscape watering.

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[31] *Ibid.*

[32] Some urban agencies also have the ability to enter "spot" water markets and to purchase water on an "as needed" basis.

[33] MWD member agency list, available at : *http://www.mwdh2o.com/mwdh2o/pages/memberag/member04.html*, accessed August 10, 2011.

The Colorado River watershed includes seven states on the western slope of the Rocky Mountains, traversing the arid southwest to the Gulf of California in Mexico. The river supplies water to 25 million people in both the U.S. and Mexico and forms the eastern border of the SCAG region. The Salton Sea, the largest inland body of water in California, was formed around 1905 when the Colorado River was diverted from its natural course. At present, the Sea serves as a drainage reservoir for agricultural runoff in the Imperial Valley and Mexico. The Salton Sea is fed by the New River and Alamo River and would dry up entirely without agricultural runoff.

TABLE 3.13-5: MAJOR WATER SUPPLIERS IN THE SCAG REGION

Water Agency	Land Area (square miles)	Sources of Water Supply
Antelope Valley and East Kern District	2,300	SWP, groundwater, reclaimed water
Bard Irrigation District (including the Yuma Project Reservation Division)	23	Colorado River
Casitas Municipal Water District	228	Groundwater
Castaic Lake Water Agency	125	SWP, Groundwater
Coachella Valley Water District	974	SWP, Colorado River, local
Crestline Lake Arrowhead	78	SWP
Desert Water Agency	324	SWP, Colorado River, groundwater
Imperial Irrigation District	1,658	Colorado River
Littlerock Creek Irrigation	16	SWP, groundwater, surface water
Metropolitan Water District of Southern California	5,200	SWP, Colorado River
Mojave Water Agency	4,900	SWA, groundwater
Palmdale Water Agency	187	SWP, groundwater
Palo Verde Irrigation District	189	Colorado River
San Bernardino Municipal Water	328	SWP, groundwater
San Gorgonio Pass Water Agency	225	Groundwater

Note: This table excludes retail agencies supplied by a regional wholesaler.
SOURCE: TAHA, 2011.

Other major natural surface waters in the SCAG region include the Ventura River, Santa Clara River, Los Angeles River, San Gabriel River, Santa Ana River, San Jacinto River, and upstream portions of the Santa Margarita River. The Ventura River is fed by Lake Casitas on the western border of Ventura County and empties out into the ocean. It is the northern-most river system in Southern California, supporting a large number of sensitive aquatic species. Water quality decreases in the lower reaches due to urban and industrial impacts. The Santa Clara River flows through the center of Ventura County and remains in a relatively natural state. Threats to water quality include increasing development in floodplain areas, flood control measures such as channeling, erosion, and loss of habitat.

The Los Angeles River is a highly disturbed system due to the flood control features along much of its length. Due to the high urbanization in the area around the Los Angeles River, runoff from industrial and commercial sources as well as illegal dumping contribute to reduce the channel's water quality. The San Gabriel River is similarly altered with concrete flood control embankments and impacted by urban runoff.

The Santa Ana River drains the San Bernardino Mountains, cuts through the Santa Ana Mountains, and flows onto the Orange County coastal plain. Recent flood control projects along the river have established reinforced embankments for much of the river's path through urbanized Orange County.

The Santa Margarita River begins in Riverside County, draining portions of the San Jacinto Mountains and flowing to the ocean through northern San Diego County.

Complete lists of surface water resources within the SCAG region along with the beneficial uses associated with them are contained in each of the five Basin Plans prepared by the Regional Water Quality Control Boards of the region.

Point and Non-Point Source Pollution. Portions of the Los Angeles River in Los Angeles County and the Santa Ana River in Orange County have been lined with concrete for flood control purposes. One of the effects of these projects has been to reduce the natural recharge of groundwater basins. A second has been to make these rivers conveyance systems that concentrate and transfer urban pollutants and waste to the ocean. With regard to the rivers themselves, the State's Water Quality Assessment Report estimated in 1992 that approximately two-thirds of California's water bodies were threatened or impaired by non-point sources of pollution.

Point source pollution refers to contaminants that enter a watershed, usually through a pipe. The location of the end of the pipe is documented and the flow out of that pipe is subject to a discharge permits issued by a Regional Water Quality Control Board. Examples of point source pollution are discharges from sewage treatment plants and industrial facilities. Because point sources are much easier to regulate than non-point sources, they were the initial focus of the 1972 Clean Water Act. Regulation of point sources since then has dramatically improved the water quality of many rivers and streams throughout the country.

In contrast to point source pollution, non-point source pollution, also known as "pollution runoff," is defuse. Non-point pollution comes from everywhere in a community and is significantly influenced by land uses. A driveway or the road in front of a house may be a source of pollution if spilled oil, leaves, pet waste or other contaminants leave the site and runoff into a storm drain. Non-point source pollution is now considered one of the major water quality problems in the United States.

Runoff Pollutants. The problem of non-point source pollution is especially acute in urbanized areas where a combination of impermeable surfaces, landscape irrigation, highway runoff and illicit dumping increase the pollutant loads in stormwater. The California State Water Quality Control Board (SWQCB) has identified the following pollutants found in urban runoff as being a particular concern.[34]

- *Sediment*. Excessive sediment loads in streams can interfere with photosynthesis, aquatic life respiration, growth and reproduction.
- *Nutrients*. Nitrogen and phosphorus can result in eutrophication of receiving waters (excessive or accelerated growth of vegetation or algae), reducing oxygen levels available for other species.
- *Bacteria and viruses*. Pathogens introduced to receiving waters from animal excrement in the watershed and by septic systems can restrict water contact activities.
- *Oxygen demanding substances.* Substances such as lawn clippings, animal excrement and litter can reduce dissolved oxygen levels as they decompose.
- *Oil and grease.* Hydrocarbons from automobiles are toxic to some aquatic life.
- *Metals*. Lead, zinc, cadmium and copper are heavy metals commonly found in stormwater. Other metals introduced by automobiles include chromium, iron, nickel and manganese. These metals can enter waterways through storm drains along with sediment, or as atmospheric deposition.
- *Toxic pollutants*. Pesticides, phenols and polynuclear aromatic hydrocarbons (PAHs) are toxic organic chemicals found in stormwater.
- *Floatables*. Trash in waterways increases metals and toxic pollutant loads in addition to undesirable aesthetic impacts.

[34]The following sections are excerpted from MWD, *The Regional Urban Water Management Plan*, Chapter IV. November 2005.

Salinity. The general quality of groundwater in the SCAG region tends to be degraded as a result of land uses and water management practices. Fertilizers and pesticides typically used on agricultural lands infiltrate and degrade groundwater. Septic systems and leaking underground storage tanks can also impact groundwater. Over-pumping can result in saltwater intrusion from the ocean, further degrading groundwater quality. In addition, wastewater discharges in inland regions can result in salt buildup from fertilizer and dairy waste.

To address the salinity problem, an increasing number of water agencies are working with other water, groundwater and wastewater agencies, state and local government agencies, and interested associations on researching and developing salinity management goals and action plans. Strategies currently in use include blending low and high salinity water and the desalination of brackish water.

Perchlorate. Ammonium perchlorate is a primary ingredient of solid rocket propellant and is used in the manufacture of some types of munitions and fireworks. Ammonium perchlorate and other perchlorate salts are readily soluble in water, dissociating into the perchlorate ion that is highly mobile in groundwater. Small amounts of perchlorate have been found in the Colorado River with higher concentrations in a number of groundwater basins in Southern California. The primary human health concern related to perchlorate is its effects on the thyroid.[35]

While perchlorate cannot be removed using conventional water treatment, nanofiltration and reverse osmosis do work effectively, but at very high cost. Rancho Cordova is using a fluidized bed biological treatment and is re-injecting the treated water back into the ground. A number of companies have developed an ion exchange process that removes perchlorate but creates hazardous waste brine. Nonetheless, a number of sites in Southern California have successfully installed ion exchange systems. Thus, while effective treatment options are available, the overriding consideration in decisions about whether to recover perchlorate-contaminated groundwater is the cost-effectiveness of available technologies.

Total Organic Carbon (TOC) and Bromide. When source water containing high levels of TOC and bromide is treated with disinfectants such as chlorine or ozone, disinfection byproducts (DBPs) form. Studies have shown a link between certain cancers and DBP exposure. In addition, some studies have shown an association between reproductive and developmental effects and chlorinated water. In December 1998, the U.S. Environmental Protection Agency (EPA) adopted more stringent regulations for DPBs.

Existing levels of TOCs and bromide in Delta water supplies present challenges to agencies receiving water from the SWP to monitor and maintain safe drinking water supplies. A primary objective of the CALFED Bay-Delta process is protection and improvement of the water quality of the SWP to ensure future drinking water regulations. Although exact future drinking water standards are unknown, significant source water protection of SWP water supplies will almost certainly be a necessary component of meeting these requirements cost-effectively.

Methyl Tertiary Butyl Ether and Tertiary Butanol (MTBE). The use of MTBE (and other oxygenates) in gasoline was mandated to achieve reductions in air pollution, including emissions of benzene, a known human carcinogen. However, this reduction in air pollution has been achieved at the expense of creating a serious groundwater and surface water problem. MTBE is very soluble in water and moves quickly into the groundwater. It is introduced into surface water bodies from the motor exhausts of recreational watercraft. MTBE is also resistant to chemical and microbial degradation in water, making treatment more difficult than the treatment of other gasoline components.

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[35]As stated in the 2010 RUWMP, "Perchlorate interferes with the thyroid gland's ability to produce hormones required for normal growth and development." MWD, *Regional Urban Water Management Plan 2010*, Chapter 4, page 4-8, available at: *http://www.mwdh2o.com/mwdh2o/pages/yourwater/RUWMP/RUWMP_2010.pdf* , accessed August 11, 2011.

MTBE presents a significant problem for local groundwater basins. Leaking underground storage tanks and poor fuel-handling practices at local gas stations may provide a large source for MTBE. One gallon of MTBE alone (11 percent MTBE by volume) is enough to contaminate about 16.5 million gallons of water at 5 μg/L.[36] Such contamination has caused some water agencies to close wells. The City of Santa Monica, for example, lost about 50 percent of its production wells as a result of MTBE contamination during the 1990s.

A combination of advanced oxidation processes followed by granular activated carbon has been found to be effective in reducing the levels of MTBE contaminants by 80 to 90 percent. This may make it possible for local water agencies to treat their groundwater sources to comply with water quality standards. The cost of such treatment, however, could cause some agencies to increase imports as a means of avoiding this cost.

Arsenic. Arsenic, a naturally occurring substance in drinking water, has been identified as a risk factor for lung and urinary bladder cancer. A number of Southern California water sources have been identified as containing arsenic concentrations exceeding the current federal standard of 10 μg/L. Monitoring results submitted to the California Department of Health Services in 2001-2003 showed that the affected areas included the counties of San Bernardino (61 sources), Los Angeles (50 sources), Riverside (24 sources) and Orange (4 sources).

It appears likely that current treatment standards will increase cost but not necessarily decrease local water supplies. However, if treatment cost increases are sufficient, some water agencies in Southern California may choose to increase their use of imported water to avoid this additional cost.

Radon. Radon, a naturally occurring substance in groundwater, has not been a significant problem for most water agencies with the SCAG region. Where radon is a problem, air-stripping through aeration is the cost-effective treatment option. However, stripping results in outgassing of radon into the air. Currently, the US EPA has determined that the risk posed by this outgassing is less than that posed by radon in the water.

Uranium. A ten-and-a-half-million-ton pile of uranium mine tailings at Moab, Utah lies 600 feet from the Colorado River. Rainwater has been seeping through the pile and contaminating the local groundwater, causing a flow of contaminants into the river. It also has the potential to wash millions of tons of material containing uranium into the Colorado River as a result of a flood or other natural disaster.

Operations and maintenance activities at the site include intercepting some of the contaminated groundwater before it discharges into the river. The interim action became fully active in September 2003 and is currently being evaluated. As of 2010, 1,408,000 gallons of contaminated water had been collected and evaporated.[37]

At the recommendation of the National Research Council, the Department of Energy (DOE) conducted a study to evaluate remediation actions and released an environmental impact statement in July 2005. The DOE has agreed to move the tailings, but remediating the site will require Congressional appropriations, and maintaining support for a cleanup will require close coordination and cooperation with other Colorado River users.

Land Use and Water Quality. Buildings, roads, sidewalks, parking lots, and other impervious surfaces define the urban landscape. But impervious surfaces also alter the natural hydrology and prevent the infiltration of water into the ground. Impervious surfaces change the flow of stormwater over the landscape. In underdeveloped areas, vegetation holds down soil, slows the flow of stormwater over land, and filters out some pollutants by both slowing the flow of the water and trapping some pollutants in the root system. Additionally, some stormwater filters through the soil, replenishing underground aquifers.

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[36] μg/L is a unit of weight equal to one-millionth (10^{-6}) of a gram.

[37] Department of Energy, Uranium Mill Tailings Remedial Action website, available at: *http://www.gjem.energy.gov/moab/project_docs/tailings_dewatering.htm*, accessed August 11, 2011.

As land is converted to other uses such as commercial developments, many of these natural processes are eliminated as vegetation is cleared and soil is paved over. As more impervious surface coverage is added to the landscape, more stormwater flows faster off the land. The greater volume of stormwater increases the possibility of flooding, and the high flow rates of stormwater do not allow for pollutants to settle out, meaning that more pollution gets concentrated in the stormwater runoff.

Research on urban stream protection has found that stream degradation occurs at relatively low levels of imperviousness—in the range of 10 to 20 percent. Wetlands suffer impairment when impervious surface coverage surpasses 10 percent. Fish habitat, spawning, and diversity suffer when imperviousness is greater than 10 to 12 percent. Wetland plants and amphibian populations diminish when impervious surfaces are greater than 10 percent. Generally, the higher the percentage of impervious surface, the greater the degradation in stream water quality. Based on this research, streams can be considered stressed in watersheds when the impervious coverage exceeds 10 to 15 percent.

The link between impervious surfaces and degraded water quality points to the need for careful comparisons between dispersed and compact development strategies. On a regional or watershed level, greater overall water quality protection is achieved through more concentrated or clustered development. Concentrated development protects the watershed by leaving a larger percentage of it in its natural condition.

Groundwater. The general quality of groundwater in the SCAG region is degraded as a result of land uses and water management practices in the Basins. Fertilizers and pesticides typically used on agricultural lands infiltrate and degrade groundwater. Septic systems and leaking underground storage tanks can also impact groundwater quality. Urban runoff is also a significant source of pollution.

Coastal Waters. Coastal waters in the region include bays, harbors, estuaries, beaches, and open ocean. Deep craft commercial harbors include the Los Angeles/Long Beach Harbor complex and Port Hueneme. Shallower small craft harbors are prevalent along the coast line including Dana Point Harbor, Newport Beach Harbor, Huntington Harbor, Marina Del Rey Harbor, and Ventura Harbor. Several small estuaries and saltwater marshes exist along the coast and are generally considered sensitive ecological areas. These include Newport Bay, Bolsa Chica Wetlands, Ballona Wetlands, Malibu Lagoon, and Mugu Lagoon. These coastal waters are impacted by previously described wastewater discharges, non-point source runoff, dredging, bilge water discharges, illicit discharges, and spills. Impaired coastal areas are shown in the map of SWRCB 303(d) impaired waterbodies (**Map 3.13-9** located in Chapter 8.0 (Maps)).

Wastewater. Wastewater flows and capacities of major treatment facilities are shown in **Table 3.13-6**. Much of the urbanized areas of Los Angeles and Orange Counties are serviced by three large publicly owned treatment works (POTWs): the City of Los Angeles Bureau of Sanitation Hyperion Facility, the Joint Outfall System of the Los Angeles County Sanitation Districts, and the Orange County Sanitation District treatment plant. These three facilities handle more than 70 percent of the wastewater generated in the entire SCAG region.

In addition to these large facilities, medium sized POTWs (greater than 10 mgd) and small treatment plants (less than 10 mgd) service smaller communities in Ventura County, southern Orange County, and in the inland regions. Many of these treatment systems recycle their effluent through local landscape irrigation and groundwater recharge projects. Other treatment systems discharge to local creeks on a seasonal basis, effectively matching the natural conditions of ephemeral and intermittent stream habitats.

Many rural communities utilize individually owned and operated septic tanks rather than centralized treatment plants. The Regional Water Quality Control Board (RWQCB) generally delegates oversight of septic systems to local authorities. However, Water Discharge Requirements (WDRs) are generally required for multiple-dwelling units and in areas where groundwater is used for drinking water. These WDRs are only issued to properties greater than one acre and are not required for properties greater than five acres in size.

TABLE 3.13-6: WASTEWATER FLOW AND CAPACITY OF MAJOR TREATMENT FACILITIES IN THE SCAG REGION

Wastewater Agency	Current Flow (mgd)	Capacity Flow (mgd)
IMPERIAL COUNTY		
City of El Centro	4.0	8.0
City of Brawley	4.0	5.9
City of Calexico	2.7	4.2
LOS ANGELES COUNTY		
Los Angeles County Sanitation Districts		
Joint Outfall System	406.1	590.2
Lancaster Water Reclamation Plant	12.0	16.0
Palmdale Water Reclamation Plant	8.0	15.0
Santa Clarita Water Reclamation Plant	20.0	28.6
City of Los Angeles	554.5	580.0
Las Virgenes Municipal Water District	9.5	16.0
City of Burbank	9.0	9.0
ORANGE COUNTY		
Orange County Sanitation District	221.0	699.0
Irvine Ranch Water District	12.3	23.5
South Orange County Wastewater Authority	26.5	37.7
El Toro Water District	5.4	6.0
RIVERSIDE COUNTY		
Eastern Municipal Water District	37.3	59.0
City of Riverside	36.0	40.0
Coachella Valley Water District	18.0	31.0
SAN BERNARDINO COUNTY		
Inland Empire Utilities Agency	60.0	84.0
City of San Bernardino	25.5	33.0
Victor Valley Wastewater Reclamation Authority	12.5	14.5
City of Redlands	6.0	9.5
VENTURA COUNTY		
City of Oxnard	22.5	31.7
City of Simi Valley	10.0	12.5
City of Thousand Oaks	10.5	14.0
City of Ventura	9.0	12.0
Camarillo Sanitation District	4.0	7.3
Total	**1,546.3**	**2,387.6**

SOURCE: TAHA, 2011.

THRESHOLDS OF SIGNIFICANCE

Based on CEQA Appendix G and as appropriate for the 2012-2035 RTP/SCS, the Plan would have a significant impact related to water resources if it would:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality, or substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;

- Substantially interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map; or place within a 100-year flood hazard area structures which would impede or redirect flood flows; or expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; and/or inundation by seiche, tsunami, or mudflow.
- Exceed the capacity of existing or planned wastewater treatment systems;
- Substantially increase demand for water such that existing supplies and facilities would not be able to accommodate demand.

Methodology

This PEIR identifies the potential impacts of the Plan on water resources. The water quality analysis evaluates the regional-scale impact of the 2012-2035 RTP/SCS and the cumulative impact of the 2012-2035 RTP/SCS projects and the associated growth on water quality. The analysis includes a programmatic-level assessment of the expected urbanized land use and the associated impervious surfaces. Subsequent, project-specific water quality assessments will be conducted by implementing agencies to determine site-specific water quality impacts for individual transportation projects, as projects in the 2012-2035 RTP/SCS are implemented.

The methodology for determining the significance of the impacts on water quality, water supply, and wastewater compares the future Plan conditions to the existing setting, as required in *CEQA Guidelines* § 15126.2(a).

Long-term, regional-scale, cumulative impacts of the 2012-2035 RTP/SCS on water quality were evaluated based on relative estimates of vacant land consumption based on the long-term regional growth forecast for 2035. Impacts to water supply were assessed by comparing the existing water supplies to the expected water demand in 2035 with the Plan. Likewise, the PEIR analyzes impacts to wastewater services by comparing existing capacity of wastewater systems to the expected demand in future Plan conditions.

Cumulative Analysis

The 2012-2035 RTP/SCS addresses transportation projects and land use distribution patterns, including land use scenarios. These land use distribution patterns identify growth distribution and anticipated land use development to accommodate growth projections. The Regional Travel Demand Model (RTDM) used for this analysis captures pass-through traffic that does not have an origin or destination in the region, but does impact the region, so that too is included in the project analysis. Although a similar level of development is anticipated even without the 2012-2035 RTP/SCS, this Plan would influence growth, including distribution patterns, throughout the region. To address this, the analysis in the PEIR covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. In addition, this PEIR considers cumulative impacts from other regional plans (e.g., South Coast Air Quality Management Plan), which could result in additional impacts inside and outside the region.

Comparison with the No Project Alternative

The analysis of water resources includes a comparison of the expected future conditions if no Plan were adopted (No Project). This evaluation is not included in the determination of the significance of impacts (which is based on a comparison to existing conditions) however it provides a meaningful perspective on the expected effects of the 2012-2035 RTP/SCS.

Project-specific studies will be necessary to determine the actual potential for significant impacts on water resources resulting from implementation of individual projects. The following analysis identifies general program-level impacts. Below are descriptions of the types of direct impacts foreseeable from new transportation projects proposed in the 2012-2035 RTP/SCS as well as anticipated development under the Plan. Indirect impacts due to the changes in population distribution expected to occur due to the 2012-2035 RTP/SCS's transportation investments, and transportation and land use policies are also discussed.

Determination of Significance

To assess potential impacts to water resources, Geographic Information Systems (GIS) were used to compare projects in the 2012-2035 RTP/SCS as well as anticipated development patterns to existing water resources. Additional data relating to water resources compiled within the GIS format included surface hydrology, 100-year flood plains, impaired water bodies identified by the SWRCB, and regional groundwater basins. The assessment of impacts also includes relative estimates of vacant land consumption based on the long-term regional growth forecast for 2035. Impacts to water supply were assessed by comparing the existing water supplies to the expected water demand in 2035 with the Plan. Likewise, the PEIR analyzes impacts to wastewater services by comparing existing capacity of wastewater systems to the expected demand in future Plan conditions.

IMPACTS

Impact 3.13-1: Potential to degrade local surface water quality by increased roadway and urban runoff created by 2012-2035 RTP/SCS projects, potentially violating water quality standards associated with wastewater and stormwater permits. The 2012-2035 RTP/SCS could alter the existing drainage patterns in ways that would result in substantial erosion or siltation.

Projects that increase impervious surface areas increase urban runoff, resulting in the transport of greater quantities of contaminants to receiving waters that may currently be impaired. Construction activities related to the Plan could increase pollutant loads carried by storm water runoff. For example, road cut erosion can increase long-term siltation in local receiving waters. Studies from across the country report that roads, parking lots, and sidewalks comprise 55 to 75 percent of existing impervious surface areas. Residential, commercial, and industrial structures constitute the remaining 25 to 45 percent. These factors explain the inverse relationship between water quality and impervious area, which tends to become problematic when impervious surfaces within a watershed exceed 10 percent of land area. Where this percentage is greater than 25 percent, water quality is generally degraded and inhospitable for habitat or for recreation activities.[38] In addition, many of the pollutants in urban runoff are attributable to landscape irrigation, highway runoff, and illicit dumping. Highway runoff is a component of urban runoff contributing oil and grease, sediment, nutrients, heavy metals, and toxic substances. **Table 3.13-7** lists the pollutants commonly associated with transportation.

[38] Center for Watershed Protection. (1988). *Rapid Watershed Planning Handbook – A Resource Guide for Urban Subwatershed Management.* Ellicott City, MD.

TABLE 3.13-7: POLLUTANTS ASSOCIATED WITH TRANSPORTATION

Pollutant	Source
Asbestos	Clutch plates, brake linings
Cadmium	Tire wear and insecticides
Copper	Thrust-bearing, bushing, brake linings, and fungicides and insecticides
Chromium	Pavement materials, metal plating, rocker arms, crankshafts, rings, and brake linings
Cyanide	Anti-caking compound in de-icing salt
Lead	Leaded gasoline, motor oil, transmission babbit metal bearings, tire wear
Iron	Auto-body rust, steel highway structures, moving engine parts
Manganese	Moving engine parts
Nickel	Diesel fuel and gasoline, pavement material, lubricating oil, metal plating, bushing wear, and brake linings
Nitrogen and Phosphorus	Motor oil additives, fertilizers
Sulphates	Roadway beds, fuel, and de-icing salt
Zinc	Motor oil and tires
Grease and Hydrocarbons	Spills and leaks of oil and n-parafin lubricants, antifreeze, hydraulic fluids
Rubber	Tire wear
Sediment	Pavement wear, construction and maintenance activities

SOURCE: USEPA Office of Water. (1995) *Controlling Nonpoint Source Runoff Pollution from Roads, Highways, and Bridges*. (EPA-841-F-95-008a). Washington DC

Map 3.13-9, located in the map chapter, shows the impaired water bodies identified within the SCAG region. The SWRCB has developed trash, metal, and bacteria TMDLs for many of the watersheds in the region, including Dominguez Channel, Santa Monica Bay, Los Angeles River, Santa Clara River, Ventura River, Malibu Creek, Calleguas Creek, and Ballona Creek. The TMDLs provide a numerical threshold for each pollutant within each watershed to be used for regulating both point and non-point source discharges and is implemented through the NPDES permit process. Future methods for quantifying highway runoff will assist regulators with applying appropriate management practices in areas where highway runoff impacts impaired water bodies. The inclusion of runoff control measures in the design of future roadway projects will improve water quality and eliminate further impairments of the local receiving waters.

As discussed above, the 2012-2035 RTP/SCS would increase impervious surfaces in the SCAG region through a combination of transportation projects and development. **Table 3.13-8** identifies proposed lane mile additions planned for each county under the Plan.

TABLE 3.13-8: 2035 PLAN LANE MILES BY COUNTY

County	Freeway Lane Miles	Toll Lane Miles	Major Arterial Lane Miles	Minor Arterial Lane Miles	Collector Lane Miles	HOV Lane Miles	Truck Lane	Total Lane Miles in Each County
Imperial	417	0	455	729	2,435	0	0	4,036
Los Angeles	4,681	476	9,234	9,155	3,780	413	193	27,931
Orange	1,426	704	3,261	3,184	604	188	0	9,367
Riverside	1,988	228	1,606	3,976	4,569	125	11	12,503
San Bernardino	2,742	192	2,379	5,030	6,535	168	226	17,271
Ventura	558	0	930	1,010	683	8	0	3,188
Total Lane Miles by Project Type	**11,811**	**1,599**	**17,866**	**23,084**	**18,606**	**902**	**430**	**74,297**

SOURCE: SCAG Transportation Modeling, 2011,

Some of the lane additions may be constructed using re-striping and existing right of way, reducing the contribution to increased impervious surfaces. Rail lines and their associated structures, would not be expected to result in a substantial change in the amount of impervious surface as most would be located within existing rights of way. This would be the case for at-grade and elevated light rail as well as heavy rail. Proposed goods movement enhancement projects would be expected to increase the amount of impervious surfaces depending on the alignment, as many of the proposed alignments are within existing rights-of-way.

Development associated with the 2012-2035 RTP/SCS would also increase imperious surfaces. Much of the development that would occur under the 2012-2035 RTP/SCS would be located in urban areas where little pervious surfaces exist and pollution of urban waterways is a serious problem. The growth projection associated with the Plan would substantially increase the amount of urbanized land in the SCAG region. With the 2012-2035 RTP/SCS, the amount of new urbanized acreage (consuming previously vacant land) would be approximately 213,000 acres.[39] Pollutant loading in surface and groundwater correlates closely with land use patterns. Suspended sediments, oxygen demanding substances, and oil and grease would constitute a substantial part of these pollutant loads. Total nitrogen and total phosphorous would increase less than these other pollutants, but would have the potential for influencing algal growth, reducing dissolved oxygen, and affecting aquatic species abundance and composition.[40] Additional impervious surfaces would increase the potential for pollutants to enter impaired receiving waters. Each project contributing to new impervious area would be subject to a Municipal Separate Storm Sewer System (MS4) permit requiring that pollutants be removed from the runoff to the maximum extent practicable. TMDL requirements are now included in all MS4 (Municipal Separate Storm Sewer System) permits, further strengthening a permit's controls of runoff.

Most of the Plan projects would occur within watersheds that have impaired water bodies. Any increase in contaminant loading in these water bodies by constituents of concern appearing in a 303(d) list and contributed by a Plan project would be considered a significant impact. **Table 3.13-9** lists many of the impaired water bodies located near a freeway, transit, or rail project proposed in the 2012-2035 RTP/SCS. Several projects may impact water bodies by placing fill material within a stream channel. For example, several of the lane widening projects and new facilities could cross existing creeks or be expanded into wetland areas. These potential intrusions would be subject to permitting by the USACE and a RWQCB pursuant to Sections 404 and 401 of the CWA.

Construction activities can be a major source of sediment loading and hydrocarbon contamination in local waterways. Unprotected soil easily erodes with rainwater. In addition, fueling procedures and maintenance of heavy equipment on construction sites can spill diesel and oil and grease. In 2003, the SWRCB adopted a state-wide storm water permit for construction sites that downsized compliance requirements from sites over five acres to sites over one acre. Prior to commencement of construction activities, a project applicant must submit a Storm Water Pollution Prevention Plan (SWPPP) to the SWRCB that identifies the Best Management Practices (BMPs) that will be used in the planned project construction. The applicant must receive approval of the SWPPP and submit a Notice of Intent prior to initiating construction. Each individual project in the 2012-2035 RTP/SCS is expected to adopt BMPs appropriate to local conditions and to the proposed construction techniques that will reduce pollution runoff.

The Plan's new roadway projects would create new impervious areas. The runoff from these new impervious areas would contribute to local water impairments by degrading the water quality of the receiving waters, both in the short-term (during project construction) and in the long-term (during the project's operation). Implementation of Mitigation Measures **MM-W1** through **MM-W30** would reduce impacts to surface water quality, runoff, wastewater, stormwater, drainage patterns, erosion, and siltation; however, impacts would remain significant.

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[39] SCAG, 2011.
[40] Keller, Arturo A. and Yi Zheng. (2003). Personal communication. University of California. Santa Barbara, CA.

TABLE 3.13-9: IMPAIRED WATER BODIES (303(D)) NEAR A FREEWAY, TRANSIT, OR RAIL PROJECT IN THE 2012-2035 RTP/SCS

Impaired Water Body	Pollutants
Aliso Creek	Indicator bacteria, Phosphorus, Toxicity
Ballona Creek	Cadmium (sediment), Coliform Bacteria, Copper, Dissolved Cyanide, Lead Selenium, Shellfish Harvesting Advisory, Silver (sediment), Toxicity, Trash, Viruses (enteric), Zinc
Ballona Creek Estuary	Cadmium, Chlordane (tissue and sediment), Copper, DDT, Lead, PAHs, PCBs, Sediment Toxicity, Shellfish Harvesting Advisory, Silver, Zinc (sediment)
Burbank Western Channel	Ammonia, Copper, Cyanide, Lead, Trash
Calleguas Creek Reach 7 (Arroyo Simi Reaches 1 and 2 on 1998 303d list)	Ammonia, Boron, Chloride, Chlorpyrifos, Diazinon, Fecal Coliform, Organophosphorus, Pesticides, Sedimentation/Siltation, Sulfates, Total Dissolved Solids, Toxicity
Calleguas Creek Reach 11 (Arroyo Santa Rosa, part of Conejo Creek Reach 3 on 1998 303d list)	Ammonia, Chem A (tissue), Chlordane, DDT, Dieldrin, Endosulfan (tissue), Fecal Coliform, PCBs, Sedimentation/Siltation, Sulfates, Total Dissolved Solids, Toxaphene (tissue and sediment), Toxicity
Calleguas Creek Reach 12 (Conejo Creek/Arroyo Conejo North Fork on 1998 303d list)	Ammonia, Chlordane (tissue), DDT (tissue), Dieldrin, PCBs, Sulfates, Total Dissolved Solids, Toxaphene
Calleguas Creek Reach 13 (Conejo Creek South Fork, was Conejo Creek Reach 4 and part of Reach 3 on 1998 303d list)	Ammonia, Chem A (tissue), Chlordane, DDT, Dieldrin, Endosulfan (tissue), Fecal Coliform, PCBs, Sulfates, Total Dissolved Solids, Toxaphene (tissue and sediment), Toxicity
Compton Creek	Coliform Bacteria, Copper, Lead, pH, Trash
Coyote Creek	Ammonia, Coliform Bacteria, Copper, Dissolved, Diazinon, Lead, pH, Toxicity, Zinc
Imperial Valley Drains	DDT, Dieldrin, Endosulfan (tissue), PCBs, Sedimentation/Siltation, Selenium, Toxphene
Laguna Canyon Channel	Sediment Toxicity
Los Angeles River Reach 1 (Estuary to Carson St)	Ammonia, Cadmium, Coliform Bacteria, Copper, Dissolved Cyanide, Diazinon, Lead, Nutrients (Algae), pH, Trash, Zinc, Dissolved
Los Angeles River Reach 2 (Carson to Figueroa St)	Ammonia, Coliform Bacteria, Copper, Lead, Nutrients (Algae), Oil, Trash
Los Angeles River Reach 3 (Figueroa St to Riverside Dr)	Ammonia, Copper, Lead, Nutrients (Algae), Trash
Los Angeles River Reach 4 (Sepulveda Dr to Sepulveda Dam)	Ammonia, Coliform Bacteria, Copper, Lead, Nutrients (Algae), Trash
Los Angeles River Reach 6 (Above Sepulveda Flood Control Basin)	1, 1-Dichloroethane (1, 1-DCE)/Vinylidene-chlori, Coliform Bacteria, Selenium, Tetrachloroethylene/PCE, Trychloroethylene/TCE
Lytle Creek	Pathogens
San Jose Creek Reach 2 (Temple to I-10 at White Ave)	Coliform Bacteria
Sawpit Creek	Bis(2ethylhexyl)phthalate/DEHP, Fecal Coliform
Tujunga Wash (LA River to Hansen Dam)	Ammonia, Coliform Bacteria, Copper, Trash
Verdugo Wash Reach 1 (LA River to Verdugo Rd)	Coliform Bacteria, Trash
Walnut Creek Wash (Drains from Puddingstone Reservoir)	pH, Toxicity
Dominguez Channel Estuary (unlined portion below Vermont Ave)	Ammonia, Benthic Community Effects, Benzo(a)pyrene (PAHs), Benzo(a)anthracene, Chlordane (tissue), Chrysene (C1-C4), Coliform Bacteria, DDT (tissue and sediment), Lead (tissue), PCBs, Phenanthrene, Pyrene, Zinc

SOURCE: SCAG analysis of California State Water Resources Control Board 303d List of Water Quality Limited Segments that: 1) require TMDLS, 2) are being addressed by USEPA approved TMDLs, and 3) are being addressed by actions other than TMDLs.

Impact 3.13-2: Potential to reduce groundwater infiltration.

The 2012-2035 RTP/SCS would include additional impervious surfaces installed through new roadway projects. **Table 3.13-8**, above, provides information on the lane mile additions expected in each county. With the implementation of the 2012-2035 RTP/SCS, approximately 6,500 new lane miles would be added to the region (for a total of 74,300 lane miles). These additions would include new facilities, additional right-of-way on existing facilities and/or re-striping of existing facilities. Rail projects involving construction of new rail lines, new stations, and upgrades to existing stations are not included in this calculation. Where these projects involve installation of additional impervious surfaces they would potentially have adverse impacts on groundwater infiltration.

Under natural conditions, vegetation intercepts and retains rainfall before infiltration or runoff occurs. Without hard-surfaced land areas, this hydrology cycle favors groundwater recharge. With a roadway or other hard surface this infiltration dynamic is significantly impeded. The magnitude of this effect is reported by studies indicating that the volume of storm water washed off one-acre of roadway is about sixteen times greater than that of a comparably sized meadow.[41]

The increase in impervious surfaces due to 6,500 additional miles of roadway, in addition to urban development associated with the population distribution in 2035 would increase runoff and potentially affect groundwater recharge rates. Implementation of Mitigation Measures **MM-W31** through **MM-W35** would reduce groundwater impacts; however, impacts would remain significant.

Impact 3.13-3: Potential to increase flooding hazards, by placing projects on alluvial fans and within 100-year flood hazard areas.

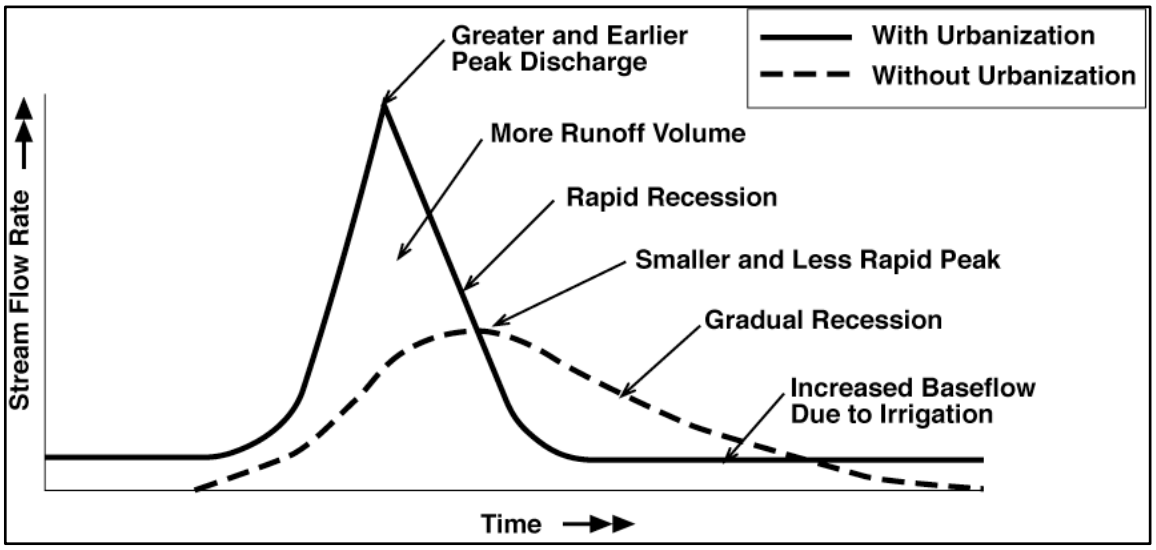
The Plan could alter existing drainage patterns or substantially increase the rate or amount of surface runoff in a manner that would result in flooding or produce or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems.

Storm water runoff is influenced by rainfall intensity, ground surface permeability, watershed size and shape, and physical barriers. The introduction of impermeable surfaces greatly reduces natural infiltration, allowing for a greater volume of runoff. In addition, paved surfaces and drainage conduits can accelerate the velocity of runoff, concentrating peak flows in downstream areas faster than under natural conditions. Significant increases to runoff and peak flow can overwhelm drainage systems and alter flood elevations in downstream locations. Increased runoff velocity can promote scouring of existing drainage facilities, reducing system reliability and safety. **Figure 3.13-1** depicts a typical hydrograph showing the effects of urbanization on peak flow rates.

The 2012-2035 RTP/SCS would result in increased impervious surfaces through transportation projects and development. Additional impervious surfaces increases storm water runoff volumes and peak flow rates. This increase has the potential to create or contribute runoff flows that would exceed the capacity of existing or planned storm water drainage systems. In addition, placing new structures within an existing floodplain can impede flood waters, altering the flood risks both upstream and downstream.

[41] Scheuler, T.R. (1994). The importance of imperviousness. *Watershed Protection Techniques 1(3)*: 100-111.

Figure 3.13-1: Hydrograph Comparison of Urbanized and Non-Urbanized Land Cover



SOURCE: Schueler, Thomas. (1997). *Controlling Urban Runoff: A Practical Manual For Planning And Designing Urban Bmps.* Metropolitan Washington Council Of Governments, Washington, D.C.

Natural desert conditions promote runoff that can cause flash flooding. In those areas of the SCAG region where soils have naturally low permeability and are subject to quick saturation, high rain volumes remain on the surface as runoff. When impervious surfaces such as highways are placed within these areas of an existing flood plain the public is exposed to the hazards of flash flooding. As discussed above, **Map 3.13-2** located in Chapter 8.0 (Maps), identifies federally designated flood hazard zones in the SCAG region. Many of the proposed highway projects would pass through these floodplain areas as currently delineated.

The highway and arterial projects proposed in the 2012-2035 RTP/SCS generally include widening existing highways, constructing new interchanges, new highway segments, new rail lines and the HRT projects. **Table 3.13-8** summarizes additional lane miles proposed for each county. Some of the proposed transit projects would involve construction of new rail lines, new stations, and upgrades to existing stations, and are not included in the calculation presented in **Table 3.13-8**.

Placing new structures within an existing floodplain can impede flood waters, altering the flood risks both upstream and downstream. The flooding risks associated with projects located in flood zones can be modified with appropriate design and alignment considerations. The amount of new urbanized acreage (consuming previously vacant land) would be on the order of 210,000 acres.[42] The additional urbanized acreage expected by 2035 could increase stormwater runoff, and could be located in areas with the potential for alluvial fan flooding or other flood hazards. Several HQTAs are include areas that are also flood hazard zones, in particular these areas on located along the coasts of Orange, Los Angeles and Ventura Counties. Implementation of Mitigation Measures **MM-W36** through **MM-W38** would reduce flooding impacts; however, impacts would remain significant.

Impact 3.13-4: Potential to exceed capacity of wastewater treatment services.

Given that wastewater generation rates are closely tied to population growth and that the total population is expected to grow by approximately 21 percent across the SCAG region by 2035, wastewater generation could increase by up to 21 percent, however, water conservation is likely to substantially reduce increases in

[42] *Ibid.*

wastewater (see below). The remaining wastewater treatment capacity derived from the data in **Table 3.15-6**, is estimated at 54 percent. Broadly assuming that wastewater capacity can be shared among the agencies in each county and that population growth would be somewhat dispersed throughout the SCAG region, it is estimated that the SCAG region would not outgrow its wastewater treatment capacity by the year 2035 especially given aggressive water conservation strategies. Therefore, cumulative impacts to wastewater treatment capacity would be less than significant. Regardless, implementation of Mitigation Measures **MM-W2** through **MM-W7** would reduce wastewater impacts.

Impact 3.13-5: Potential to contribute to an increased demand for water supply and its associated infrastructure.

Water agencies in the SCAG region produce Urban Water Management Plans (UWMPs) and other long-range planning studies to provide a system adequate to supply water demand. At existing usage rates, the existing water supplies and infrastructure would not be sufficient to meet demand in 2035. The volume of water and water delivery infrastructure currently available within the SCAG region would not be sufficient to meet the future multiple dry year or average year water demand in 2035. As population increases in the SCAG region, the demand for municipal water could increase. Increased commercial and industrial land uses could also increase water demand. However, many agencies are implementing aggressive water conservation, recycling and planning strategies (water transfer and water banking) to reduce demand and even out supply in wet and dry years. The City of Los Angeles for example has maintained relatively constant water demand over the past ten years as a result of water conservation, and the 2010 UWMP anticipates that water demand will continue to remain relatively constant through the year 2035 despite increasing population.

Reduction in water supply, as well as uncertainty in the reliability of that supply, could result from increased temperatures due to global climate change, as well as regulatory or legislative decisions that affect the availability of imported water.

Meeting future water demand is the responsibility of local and regional water agencies. Water supplies are either produced locally from groundwater and surface water sources or are imported via the Los Angeles Aqueduct, the California Aqueduct, the Colorado River Aqueduct, the All American Canal, or the Coachella Canal. Other means of providing water without increasing imported supplies include reclamation and recycling, conservation, water transfers, groundwater banking, developing brackish groundwater, and ocean desalination.

The Urban Water Management Plan Act of 1990 requires that local water agencies prepare plans showing projected water supplies and demands for average years and multiple dry years. These plans are updated every five years. Some water agencies project average year water deficits by the year 2020 if current management and supply efforts are not augmented. Other agencies project no deficits owing to the development of new supplies and management efforts. These projections all face the same uncertainty in regard to the long-term affects of global climate change on the region's water supply.

MWD has prepared the 2010 Integrated Water Resources Plan that provides a roadmap for maintaining regional water supply reliability over the next 25 years. The framework places an increased emphasis on regional collaboration. Earlier plans dating back to 1996 set a regional reliability goal of meeting full-service demands at the retail level under all foreseeable hydrologic conditions. This updated plan seeks to stabilize Metropolitan's traditional imported water supplies and to continue developing additional local resources.

It also advances long-term planning for potential future contingency resources, such as storm water capture and large-scale seawater desalination, in close coordination with MWD's 26 member public agencies and other utilities. The updated IRP strikes a balance through a three-component approach:

- A core resources strategy represents baseline efforts to manage water supply and demand conditions and to stabilize MWD's traditional imports from the Colorado River and Northern California through the Sacramento-San Joaquin Delta. This strategy is based on known factors, including detailed planning assumptions about future demographic scenarios, water supply yields, and a range of observed historical weather patterns. Under this strategy, MWD and its member agencies will advance water use efficiency through conservation and recycling, and with further local development such as groundwater recovery and seawater desalination.

- A cost-effective "supply buffer" will enable the region to adapt to future circumstances and foreseeable challenges. The buffer seeks to help protect the region from possible shortages caused by conditions that exceed the core resources strategy, starting with increased conservation and water-use efficiency on a region-wide basis.

- Foundational actions guide the region in determining alternative supply options for long-range planning. If future changed conditions—such as climate change or the availability of resources—exceed what is covered by MWD's core resources and supply buffer, these alternatives would provide a greater contribution to water reliability than MWD's imported water sources or any other single supply. These actions - including feasibility studies, research and regulatory review - would provide the foundation to develop alternative resources, if needed.

Over 80 percent of the projected population in the SCAG region in 2035 is within the MWD service area.

Supplying the water necessary to meet future demand and/or minimizing that demand would mitigate anticipated impacts. Each water district develops its own policy for determining its planning horizon and for acquiring and building water facilities. Water districts provide water for the growth planned and authorized by the appropriate land use authority. However, given the challenges to imported water supplies, meeting future demand is difficult. Implementation of Mitigation Measures **MM-W39** through **MM-W68** would reduce water supply impacts, however, impacts would remain potentially significant as a result of uncertainties in water supply.

Impact 3.13-6: Potential to contribute to cumulatively considerable demand on water resources.

As described in the existing setting, much of the water that is consumed in the SCAG region is imported from other parts of the State. As a result, any increase in water demand in the SCAG region would affect areas outside the region by consuming water that could be used in other areas. As noted above, it is anticipated that aggressive water conservation as well as other water management strategies (water transfers, water banking, etc.) will result in adequate supplies to the region. Due to the uncertainties associated with water supply and management this impact is considered cumulatively considerable.

Impacts described above such as flooding would be site specific and would not result in cumulative effects.

MITIGATION MEASURES

Mitigation Measures **MM-W1**, **MM-W14**, **MM-W41**, **MM-W42**, **MM-W45**, and **MM-W67** shall be implemented by SCAG over the lifetime of the 2012-2035 RTP/SCS to address water issues as indicated below. Mitigation Measures **MM-W2** through **MM-W13**, **MM-W15** through **MM-W40**, **MM-W43**, **MM-W44**, **MM-W46** through **MM-W65**, and **MM-W68** can and should be implemented by local agencies, water districts and project sponsors (for both development and transportation projects) as applicable. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions. Projects taking advantage of CEQA Streamlining provisions of SB 375 can and should apply mitigation measures as appropriate to site-specific conditions.

Water Quality

MM-W1: SCAG shall continue to work with local jurisdictions and water quality agencies, and other means, to encourage regional-scale planning for improved water quality management and pollution prevention. Future impacts to water quality shall be avoided to the extent practical and feasible through cooperative planning, information sharing, and comprehensive pollution control measure development within the SCAG region. This cooperative planning shall occur as part of current and existing coordination, an integral part of SCAG's ongoing regional planning efforts.

Wastewater

MM-W2: Local jurisdictions can and should encourage new development and industry to locate in those service areas with existing wastewater infrastructure and treatment capacity, making greater use of those facilities prior to incurring new infrastructure costs.

MM-W3: Local jurisdictions can and should promote reduced wastewater system demand by: designing wastewater systems to minimize inflow and increase upstream treatment and infiltration to the extent feasible, reducing overall source water generation by domestic and industrial users, deferring development approvals for industries that generate high volumes of wastewater until wastewater agencies have expanded capacity.

MM-W4: Wastewater treatment agencies are encouraged to have expansion plans, approvals and financing in place once their facilities are operating at 80 percent of capacity. SCAG shall provide opportunities for information sharing and program development.

MM-W5: Project sponsors can and should coordinate with the local wastewater provider in order to ensure that existing and/or planned sewer conveyance and treatment facilities are capable of meeting wastewater flow capacity requirements. Each project sponsor can and should identify specific on- and off-site improvements needed to ensure that impacts related to wastewater conveyance capacity are addressed prior to issuance of plans. Sewer capacity clearance from the local wastewater provider will be required at the time that a sewer connection permit application is submitted.

MM-W6: As appropriate, confirmation of the capacity of the surrounding stormwater and sanitary sewer system and state of repair can and should be completed by a qualified civil engineer with funding from the project sponsor. The project sponsor can and should be responsible for the necessary stormwater and sanitary sewer infrastructure improvements to accommodate the proposed project. In addition, the sponsor can and should be required to pay any fees to improve sanitary sewer infrastructure as may be required by the applicable local agencies. Improvements to the existing sanitary sewer collection system can and should specifically include, but are not limited to, mechanisms to control or minimize increases in infiltration/inflow to offset sanitary sewer increases associated with the proposed project. To the maximum extent practicable, the sponsor will be required to implement Best Management Practices to reduce the peak stormwater runoff from the project site. Additionally, the project sponsor can and should be responsible for payment of any required installation or hook-up fees to the affected service providers.

MM-W7: Wastewater treatment agencies can and should maximize efficiency of wastewater treatment and pumping equipment.

Riparian Habitats and Waters of the US

MM-W8: Project sponsors with projects requiring the discharge of dredged or fill materials into U.S. waters, including wetlands, can and should comply with sections 404 and 401 of the Clean Water Act including the requirement to obtain a permit from the U.S. Army Corps of Engineers and the governing Regional Water Quality Control Board.

MM-W9: Project sponsor can and should ensure that natural riparian conditions near projects are maintained, wherever feasible, to minimize the effects of stormwater flows at stream crossings. Where feasible, riparian areas can and should be restored or expanded to mitigate additional impervious surface and associated runoff.

MM-W10: Prior to construction within the vicinity of a watercourse, the project sponsor can and should obtain all necessary regulatory permits and authorizations from the U.S. Army Corps of Engineers (Corps), Regional Water Quality Control Board (RWQCB), California Department of Fish and Game, California Coastal Commission, and local jurisdictions, and should comply with all conditions issued by applicable agencies. Required permit approvals and certifications may include, but not be limited to the following:

- U.S. Army Corps of Engineers (Corps): Section 404. Permit approval from the Corps should be obtained for the placement of dredge or fill material in Waters of the U.S., if any, within the interior of the project site, pursuant to Section 404 of the federal Clean Water Act.
- Regional Walter Quality Control Board (RWQCB): Section 401 Water Quality Certification. Certification that the project will not violate state water quality standards is required before the Corps can issue a 404 permit, above.
- California Department of Fish and Game (CDFG): Section 1602 Lake and Streambed Alteration Agreement. Work that will alter the bed or bank of a stream requires authorization from CDFG.

A qualified environmental consultant can and should be retained and paid for by the project sponsor to make site visits as necessary; and as a follow-up, submit to the Lead Agency a letter certifying that all required conditions have been instituted during the grading activities.

MM-W11: Prior to issuance of a demolition, grading, or building permit within vicinity of a watercourse project sponsors can and should develop a final detailed landscaping and irrigation plan for review and approval by the appropriate local jurisdiction prepared by a licensed landscape architect or other qualified person. Such a plan should include a planting schedule, detailing plant types and locations, and a system for temporary irrigation of plantings.

- Plant and maintain only drought-tolerant plants on the site where appropriate, as well as native and riparian plants in and adjacent to riparian corridors. Along the riparian corridor, native plants should not be disturbed to the maximum extent feasible. Any areas disturbed along the riparian corridor should be replanted with mature native riparian vegetation and be maintained to ensure survival.
- All landscaping indicated on the approved landscape plan should be installed prior to the issuance of a Final inspection of the building permit, otherwise permitted. .
- All landscaping areas shown on the approved plans should be maintained in neat and safe conditions, and all plants should be maintained in good growing condition and, whenever necessary replaced with new plant materials to ensure continued compliance with all applicable landscaping requirements. All paving or impervious surfaces should occur only on approved areas.

Runoff/Drainage

MM-W12: Project sponsors can and should comply with the State-wide construction storm water discharge permit requirements including preparation of Storm Water Pollution Prevention Plans for transportation improvement construction projects. Roadway construction projects can and should comply with the Caltrans storm water discharge permit. Best Management Practices can and should be identified and implemented to manage site erosion, wash water runoff, and spill control.

MM-W13: Project sponsors can and should comply with the requirements of the National Pollutant Discharge Elimination System (NPDES). The project sponsor can and should submit with the application for a building permit (or other construction-related permit) a completed Construction-Permit-Phase Stormwater Supplemental Form. The project drawings submitted for the building permit (or other construction-related permit) should contain a stormwater management plan, for review and approval by the appropriate agency, to manage stormwater run-off and to limit the discharge of pollutants in stormwater after construction of the project to the maximum extent practicable. The post-construction stormwater management plan should include and identify the following:

- All proposed impervious surface on the site;
- Anticipated directional flows of on-site stormwater runoff; and
- Site design measures to reduce the amount of impervious surface area and directly connected impervious surfaces; and
- Source control measures to limit the potential for stormwater pollution;
- Stormwater treatment measures to remove pollutants from stormwater runoff; and
- Hydromodification management measures so that post-project stormwater runoff does not exceed the flow and duration of pre-project runoff, if required under the NPDES permit.

The following additional information should be submitted with the post-construction stormwater management plan:

- Detailed hydraulic sizing calculations for each stormwater treatment measure proposed; and
- Pollutant removal information demonstrating that any proposed manufactured/ mechanical (i.e. non-landscape-based) stormwater treatment measure, when not used in combination with a landscape-based treatment measure, is capable or removing the range of pollutants typically removed by landscape-based treatment measures and/or the range of pollutants expected to be generated by the project.

All proposed stormwater treatment measures can and should incorporate appropriate planting materials for stormwater treatment (for landscape-based treatment measures) and should be designed with considerations for vector/mosquito control. Proposed planting materials for all proposed landscape-based stormwater treatment measures should be included on the landscape and irrigation plan for the project. The sponsor is not required to include on-site stormwater treatment measures in the post-construction stormwater management plan if he or she secures approval from an appropriate agency that an alternate approach is appropriate. The project sponsor can and should implement the approved stormwater management plan.

MM-W14: SCAG shall continue to work with local jurisdictions and water agencies, to encourage regional-scale planning for improved stormwater management and groundwater recharge, including consideration of alternative recharge technologies and practices. Future adverse impacts shall be avoided through cooperative planning, information sharing, and comprehensive implementation efforts within the SCAG region.

MM-W15: Project sponsors can and should consult with the RWQCB and Storm Water Management Plan permit holders as projects are designed to ensure that projects protect the goals of the Clean Water Act and comply with federal storm water NPDES permits.

MM-W16: Project sponsors can and should ensure that new facilities include structural water quality control features such as drainage channels, detention basins, oil and grease traps, filter systems, and vegetated buffers to prevent pollution of adjacent water resources by polluted runoff where required by applicable urban storm water runoff discharge permits.

MM-W17: Structural storm water runoff treatment can and should be provided according to the applicable urban storm water runoff permit where facilities will be operated by a permitted municipality or county. Where Caltrans is the operator, the statewide permit applies.

MM-W18: Project sponsors can and should ensure that operational best management practices for street cleaning, litter control, and catch basin cleaning are implemented to prevent water quality degradation in compliance with applicable storm water runoff discharge permits. Efforts can and should be made to assure treatment controls are in place as early as possible, such as during the acquisition process for rights-of-way, not just later during the facilities design and construction phase.

MM-W19: In compliance with applicable municipal separate storm sewer system discharge permits as well as Caltrans' storm water discharge permit, long-term sediment control can and should be affected through erosion control and revegetation programs designed to allow reestablishment of native vegetation on slopes and undeveloped areas.

MM-W20: Drainage of roadway runoff can and should comply with Caltrans' storm water discharge permit. Wherever possible, roadways can and should be designed to convey storm water through vegetated median strips that provide detention capacity and allow for infiltration before reaching culverts.

MM-W21: Treatment and control features such as detention basins, infiltration strips, and porous paving, other features to control surface runoff and facilitate groundwater recharge can and should be incorporated into the design of new transportation projects early on in the process to ensure that adequate acreage and elevation contours are provided during the right-of-way acquisition process.

MM-W22: Project sponsors can and should assure projects mitigate for changes to the volume of runoff, where any downstream receiving water body has not been designed and maintained to accommodate the increase in flow velocity, rate, and volume without impacting the water's beneficial uses. Pre-project flow velocities, rates, and volumes must not be exceeded. This applies not only to increases in storm water runoff from the project site, but also to hydrologic changes induced by flood plain encroachment. Projects should not cause or contribute to conditions that degrade the physical integrity or ecological function of any downstream receiving waters.

MM-W23: Impacts can and should be reduced to the extent possible by providing culverts and facilities that do not increase the flow velocity, rate, or volume and/or acquiring sufficient storm drain easements that accommodate an appropriately vegetated earthen drainage channel.

MM-W24: Project sponsors of improvement projects on existing facilities can and should include upgrades to stormwater drainage facilities to accommodate any increased runoff volumes. These upgrades may include the construction of detention basins or structures that will delay peak flows and reduce flow velocities, including expansion and restoration of wetlands and riparian buffer areas. System designs can and should be completed to eliminate increases in peak flow rates from current levels.

MM-W25: Local jurisdictions can and should encourage Low Impact Development and incorporation of natural spaces that reduce, treat, infiltrate and manage stormwater runoff flows in all new developments, where practical and feasible.

MM-W26: Project sponsor can and should ensure that for sites less than one acre, project drawings submitted for a building permit (or other construction-related permit) contain a final site plan to be reviewed and approved by the appropriate local agency. The final site plan should incorporate appropriate site design measures to manage stormwater runoff and minimize impacts to water quality after the construction of the project. These measures may include, but are not limited to, the following:

- Minimize impervious surfaces, especially directly connected impervious surfaces;
- Utilize permeable paving in place of impervious paving where appropriate;
- Cluster buildings;
- Preserve quality open space; and
- Establish vegetated buffer areas.

The approved plan should be implemented and the site design measures shown on the plan should be permanently maintained.

MM-W27: Project sponsors can and should implement BMPs to reduce erosion, sedimentation, and water quality impacts during construction to the maximum extent practicable. Plans demonstrating BMPs should be submitted for review and approval by the Lead Agency. At a minimum, the project sponsor can and should provide filter materials deemed acceptable to the Lead Agency at nearby catch basins to prevent any debris and dirt from flowing into the local storm drain system and creeks.

MM-W28: Project sponsors for sites over one acre, must obtain coverage under the General Construction Activity Storm Water Permit (General Construction Permit) issued by the State Water Resources Control Board (SWRCB). The project sponsor must file a notice of intent (NOI) with the SWRCB. The project sponsor will be required to prepare a stormwater pollution prevention plan (SWPPP) and submit the plan for review and approval by the Lead Agency. At a minimum, the SWPPP should include a description of construction materials, practices, and equipment storage and maintenance; a list of pollutants likely to contact stormwater; site-specific erosion and sedimentation control practices; a list of provisions to eliminate or reduce discharge of materials to stormwater; BMPs, and an inspection and monitoring program. Prior to the issuance of any construction-related permits, the project sponsor should submit to the lead agency a copy of the SWPPP and evidence of submittal of the NOI to the SWRCB. Implementation of the SWPPP should start with the commencement of construction and continue though the completion of the project. After

construction is completed, the project sponsor can and should submit a notice of termination to the SWRCB.

MM-W29: Project sponsors can and should ensure that project drawings submitted for a building permit (or other construction-related permit) contain a drainage plan to be reviewed and approved by the appropriate agency. The drainage plan should include measures to reduce the post-construction volume and velocity of stormwater runoff to the maximum extent practicable. Stormwater runoff should not be augmented to adjacent properties or creeks. The drainage plan should include and identify the following:

- All proposed impervious surface on the site;
- Anticipated directional flows of on-site stormwater runoff;
- Site design measures to reduce the amount of impervious surface area and directly connected impervious surfaces;
- Source control measures to limit the potential for stormwater pollution; and
- Stormwater treatment measures to remove pollutants from stormwater runoff.

MM-W30: Project sponsors can and should submit an erosion and sedimentation control plan for review and approval by the appropriate government agency. All work should incorporate all applicable BMPs for the construction industry, including BMP's for dust, erosion and water quality. The measures should include, but are not limited to, the following:

- On sloped properties, the downhill end of the construction area must be protected with silt fencing (such as sandbags, filter fabric, silt curtains, etc.) and hay bales oriented parallel to the contours of the slope (at a constant elevation) to prevent erosion into the street, gutters, stormdrains.
- In accordance with an approved erosion control plan, the project sponsor should implement mechanical and vegetative measures to reduce erosion and sedimentation, including appropriate seasonal maintenance. One hundred (100) percent degradable erosion control fabric should be installed on all graded slopes to protect and stabilize the slopes during construction and before permanent vegetation gets established. All graded areas should be temporarily protected from erosion by seeding with fast growing annual species. All bare slopes must be covered with staked tarps when rain is occurring or is expected.
- Minimize the removal of natural vegetation or ground cover from the site in order to minimize the potential for erosion and sedimentation problems. Maximize the replanting of the area with native vegetation as soon as possible.
- Install filter materials acceptable to the appropriate agency at the storm drain inlets nearest to the project site prior to the start of the wet weather season (October 15); site dewatering activities; street washing activities; saw cutting asphalt or concrete; and in order to retain any debris flowing into the storm drain system. Filter materials should be maintained and/or replaced as necessary to ensure effectiveness and prevent street flooding.
- Ensure that concrete/granite supply trucks or concrete/plaster finishing operations do not discharge wash water into water courses, street gutters, or storm drains.
- Direct and locate tool and equipment cleaning so that wash water does not discharge into the street, gutters, or stormdrains.
- Create a contained and covered area on the site for storage of bags of cement, paints, flammables, oils, fertilizers, pesticides, or any other materials used on the project site that have the potential for being discharged to the storm drain system by the wind or in the event of a material spill. No hazardous waste material should be stored on-site.

- Gather all construction debris on a regular basis and place them in a dumpster or other container which is emptied or removed on a weekly (or other interval approved by the Lead Agency) basis. When appropriate, use tarps on the ground to collect fallen debris or splatters that could contribute to stormwater pollution.
- Remove all dirt, gravel, refuse, and green waste from the sidewalk, street pavement, and storm drain system adjoining the project site. During wet weather, avoid driving vehicles off paved areas and other outdoor work.
- As appropriate, broom sweep the street pavement adjoining the project site on a daily basis. Caked-on mud or dirt should be scraped from these areas before sweeping. At the end of each workday, the entire site must be cleaned and secured against potential erosion, dumping, or discharge to the street, gutter, and/or stormdrains.
- All erosion and sedimentation control measures implemented during construction activities, as well as construction site and materials management should be in strict accordance with the control standards listed in the latest edition of the Erosion and Sediment Control Field Manual published by the RWQB.
- All erosion and sedimentation control measures should be monitored regularly by the project sponsor. If measures are insufficient to control sedimentation and erosion then the project sponsor should develop and implement additional and more effective measures immediately.

Groundwater

MM-W31: Project sponsors can and should ensure that projects requiring continual dewatering facilities implement monitoring systems and long-term administrative procedures to ensure proper water management that prevents degrading of surface water and minimizes, to the greatest extent possible, adverse impacts on groundwater for the life of the project. Construction designs can and should comply with appropriate building codes and standard practices including the Uniform Building Code.

MM-W32: Project sponsors, lead agencies, and local jurisdictions can and should maximize, where practical and feasible, permeable surface area in existing urbanized areas to protect water quality, reduce flooding, allow for groundwater recharge, and preserve wildlife habitat. New impervious surfaces can and should be minimized to the greatest extent possible, including the use of in-lieu fees and off-site mitigation.

MM-W33: Project sponsors can and should avoid designs that require continual dewatering where feasible.

MM-W34: Where feasible, transportation facilities can and should not be sited in groundwater recharge areas, to prevent conversion of those areas to impervious surface.

MM W35: Project sponsors can and should reduce hardscape to the extent feasible to facilitate groundwater recharge as appropriate.

Flood Protection

MM-W36: Project sponsor can and should ensure that all roadbeds for new highway and rail facilities be elevated at least one foot above the 100-year base flood elevation. Since alluvial fan flooding is not often identified on FEMA flood maps, the risk of alluvial fan flooding should be evaluated and projects should be sited to avoid alluvial fan flooding. Delineation of floodplains and alluvial fan boundaries should attempt to account for future hydrologic changes caused by global climate change.

MM-W37: Project sponsors of transportation improvements can and should comply with local, state, and federal floodplain regulations. Projects requiring federal approval or funding should comply with Executive Order 11988 on Floodplain Management, which requires avoidance of incompatible floodplain development, restoration and preservation of the natural and beneficial floodplain values, and maintenance of consistency with the standards and criteria of the National Flood Insurance Program.

MM-W38: Local jurisdictions can and should, to the extent feasible and appropriate, prevent development in flood hazard areas that do not have appropriate protections, especially in alluvial fan areas of the region.

Water Supply

MM-W39: Local water agencies can and should continue to evaluate future water demands and establish the necessary supply and infrastructure to meet that demand, as documented in their Urban Water Management Plans.

MM-W40: Project sponsors, local jurisdictions, and water agencies can and should include conjunctive use as a water management strategy when feasible.

MM-W41: SCAG, in coordination with regional water agencies and other stakeholders, shall encourage the kind of regional coordination throughout California and the Colorado River Basin that develops and supports sustainable policies in accommodating growth.

MM-W42: SCAG, in coordination with regional water agencies and other stakeholders, shall facilitate information sharing about the management and status of the Sacramento River Delta, the Colorado River Basin, and other water supply source areas of importance to local water supply.

MM-W43: Regional water agencies can and should consider, to the greatest extent feasible, potential climate change hydrology and attendant impacts on available water supplies and reliability in the process of creating or modifying systems to manage water resources for both year-round use and ecosystem health. As the methodology and base data for such decisions is still developing, agencies can and should use the best currently available science in decision making. Local jurisdictions and water agencies can and should rely on current regional analyses when making local decisions regarding future water supply and reliability.

MM-W44: Project sponsors and local jurisdictions can and should reduce exterior uses of water in public areas, and should promote reductions in private homes and businesses, by shifting to drought-tolerant native landscape plantings (xeriscaping), using weather-based irrigation systems, educating other public agencies about water use, and installing related water pricing incentives. Local jurisdictions can and should also work with local retailers and vendors to promote the availability of drought resistant landscaping options and provide information on where these can be purchased. Use of reclaimed water especially in median landscaping and hillside landscaping can and should be implemented where feasible.

MM-W45: Future impacts to water supply shall be minimized through cooperation, information sharing, and program development as part of SCAG's on-going regional planning efforts, in coordination with regional water agencies and other stakeholders.

MM-W46: Project sponsors can and should coordinate with the local water provider to ensure that existing and/or planned water supply and water conveyance facilities are capable of meeting water demand/pressure requirements. In accordance with State Law, a Water Supply Assessment can and should be required for projects that meet the size requirements specified in the regulations. In coordination with the local water provider, each project sponsor will identify specific on- and off-site improvements needed to ensure that impacts related to water supply and conveyance demand/pressure requirements are addressed prior to issuance of a certificate of occupancy. Water supply and conveyance demand/pressure clearance from the local water provider will be required at the time that a water connection permit application is submitted.

MM-W47: Project sponsors can and should coordinate with the local fire service provider in order to ensure that existing and/or planned fire hydrants are capable of meeting fire flow demand/pressure requirements. The issuance of building permits will be dependent upon submission, review, approval, and testing of fire flow demand and pressure requirements, as established by the local fire service provider prior to occupancy.

MM-W48: Project sponsors can and should implement water conservation measures in new development that should include but not be limited to the following:

- Installation of high-efficiency toilets (1.28 gallons per flush or less, includes dual flush.
- High-efficiency urinals (0.125 gallons per flush or less, includes waterless)
- Restroom faucet flow rate of 1.5 gallons per minute or less
- Public restroom faucet flow rate of 0.5 gallons per minute or less and self-closing
- Showerhead flow rate of 2.0 gallons per minute or less
- Limit of one showerhead per shower stall
- High efficiency clothes washers (water factor of 4.0 or less)
- High efficiency dishwashers (Energy Star rated)
- Domestic water heating system located in close proximity to point(s) of use, as feasible; use of tankless and on-demand water heaters as feasible
- Cooling towers must be operated at a minimum of 5.5 cycles of concentration
- Install on-site water recycling as feasible
- Use of recycled water (if available) for appropriate end uses (irrigation, cooling towers, sanitary)
- Single pass cooling should be prohibited (e.g. any vacuum pumps or ice machines)
- Irrigation should include:
  - Weather-based irrigation controller with rain shutoff
  - Flow sensor and master valve shutoff (for large landscaped areas)
  - Matched precipitation (flow) rates for sprinkler heads
  - Drip/microspray/subsurface irrigation where appropriate
  - Minimum irrigation system distribution uniformity of 75%
  - Proper hydro-zoning, turf minimization and use of native/drought tolerant plant materials
  - Use of landscape contouring to minimize precipitation runoff

MM-W49: Project sponsors can and should consult with the local water provider to identify feasible and reasonable measures to reduce water consumption, including, but not limited to, systems to use reclaimed water for landscaping, drip irrigation, re-circulating hot water systems, water conserving landscape techniques (such as mulching, installation of drip irrigation systems, landscape design to group plants of similar water demand, soil moisture sensors, automatic

irrigation systems, clustered landscaped areas to maximize the efficiency of the irrigation system), water conserving kitchen and bathroom fixtures and appliances, thermostatically controlled mixing valves for baths and showers, and insulated hot water lines.

MM-W50: Project sponsors can and should incorporate compliance with local drought measures as appropriate including prohibiting hose watering of driveways and associated walkways; requiring decorative fountains to use recycled water, and repairing water leaks in a timely manner.

MM-W51: Project sponsors can and should incorporate automatic sprinkler systems that irrigate landscaping during morning hours or during the evening to reduce water losses from evaporation. Sprinklers should be required to reset to water less often in cooler months and during the rainfall season, so that water is not wasted in excessive landscape irrigation.

MM-W52: Prior to issuance of building permits, project sponsors can and should pay any appropriate fees imposed by local water providers to off-set any fair share project costs as identified by the local water provider.

MM-W53: As part of the general plan update process, local jurisdictions can and should coordinate with water providers to identify water budgets for development within their jurisdiction. Local water providers may provide for new water supply through a combination of water conservation (on and potentially off-site) and recycled water, such that the net increase in water demand (not including demand for recycled water) does not exceed the calculated demand anticipated in the most recent Urban Water Management Plan or other similar document.

MM-W54: Project sponsors can and should create water-efficient landscapes.

MM-W55: Project sponsors can and should install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls and use water-efficient irrigation methods.

MM-W56: Project sponsors can and should incorporate water-reducing features into building and landscape design.

MM-W57: Project sponsors should make effective use of graywater for landscape irrigation. (Graywater is untreated household wastewater from bathtubs, showers, bathroom wash basins, and water from clothes washing machines.)

MM-W58: Project sponsors can and should implement low-impact development practices that maintain the existing hydrology of the site to manage storm water and protect the environment by doing the following:

- Devise a comprehensive water conservation strategy appropriate for the project and location.
- Design buildings to be water-efficient. Install water-efficient fixtures and appliances.
- Offset water demand from new projects so that there is no net increase in water use.
- Provide education about water conservation and available programs and incentives.

MM-W59: Local jurisdictions can and should adopt and implement a comprehensive strategy to increase water conservation and the use of recycled water that includes similar measure to the following:

- **Water Consumption Reduction Target:** Regional water agencies should work together to set a target for to reduce per capita water consumption by 2020.
- **Water Conservation Plan:** Regional water agencies should establish a water conservation plan that may include such policies and actions as:
  - Tiered rate structures for water use;
  - Restrictions on time of use for landscape watering, and other demand management strategies;
  - Performance standards for irrigation equipment and water fixtures;
  - Requirements that increased demand from new construction be offset with reductions so that there is no net increase in water use.
- **Recycled Water Use:** Local jurisdictions and regional water agencies should establish programs and policies to increase the use of recycled water, including:
  - Create an inventory of non-potable water uses within the jurisdiction that could be served with recycled water;
  - Produce and promote the use of recycled water for agricultural, industrial, and irrigation purposes, including grey water systems for residential irrigation;
  - Produce and promote the use of treated, recycled water for potable uses where GHG emissions from producing such water are lower than from other potable sources.
- **Water Conservation Outreach:** Local jurisdictions and regional water agencies should implement a public education and outreach campaign to promote water conservation, and highlights specific water-wasting activities to discourage, such as the watering of non-vegetated surfaces and using water to clean sidewalks and driveways.

MM-W60: Local jurisdictions can and should ensure that building standards and permit approval processes promote and support water conservation.

MM-W61: Local jurisdictions can and should establish building design guidelines and criteria to promote water-efficient building design, including minimizing the amount of non-roof impervious surfaces around the building(s).

MM-W62: Local jurisdictions can and should establish menus and check-lists for developers and contractors to ensure water-efficient infrastructure and technology are used in new construction, including low-flow toilets and shower heads, moisture-sensing irrigation, and other such advances.

MM-W63: SCAG, in coordination with the State Water resources Board, shall encourage cities, counties and water districts to develop local sources of potable water including recycling where feasible.

MM-W64: Local jurisdictions can and should establish criteria and standards to permit the safe and effective use of gray water (on-site water recycling), and review and appropriately revise, without compromising health and safety, other building code requirements that might prevent the use of such systems.

MM-W65: Local jurisdictions can and should establish programs and policies to ensure landscaping and forests are installed and managed to optimize their climate benefits.

MM-W66: Project sponsors can and should install water efficient landscapes and irrigation, including:

- Planting drought-tolerant and native species, and covering exposed dirt with moisture-retaining mulch;
- Installing water-efficient irrigation systems and devices, including advanced technology such as moisture-sensing irrigation controls; and/or
- Installing edible landscapes that provide local food.

MM-W67: SCAG, as part of its on-going outreach and technical assistance efforts, shall organize workshops on water conservation activities, such as selecting and planting drought tolerant, native plants in landscaping, and installing advanced irrigation systems.

MM-W68: Regional water agencies can and should maximize efficiency at drinking water treatment, pumping, and distribution facilities, including development of off-peak demand schedules for heavy commercial and industrial users.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Water Quality

Implementation of Mitigation Measure **MM-W1** would reduce the potential impacts to water quality; however, due to the regional scale of the Plan, the impacts remain significant.

Wastewater

Implementation of Mitigation Measures **MM-W2** through **MM-W7** would reduce the potential impacts to wastewater; however, due to the regional scale of the Plan, the impacts remain significant.

Riparian Habitats and Waters of the U.S.

Implementation of Mitigation Measures **MM-W8** through **MM-W11** would reduce the potential impacts to riparian habitats and waters of the U.S. in the SCAG region; however, due to the regional scale of the Plan, the impact remains significant.

Runoff/Drainage

Implementation of Mitigation Measures **MM-W12** through **MM-W30** would reduce the potential impacts to runoff/drainage; however, due to the regional scale of the Plan, the impacts remain significant.

Groundwater

Implementation of Mitigation Measures **MM-31** through **MM-W35** would reduce the potential impacts to groundwater; however, due to the regional scale of the Plan, the impacts remain significant.

Flood Protection

Implementation of Mitigation Measures **MM-W36** through **MM-W38** would reduce the potential impacts to flooding; however, due to the regional scale of the Plan, the impacts remain significant.

Water Supply

Implementation of Mitigation Measures **MM-W39** through **MM-W68** would reduce the potential impacts related to water supply; however, due to the regional scale of the Plan and uncertainty in water supply, the impacts remain potentially significant.

Cumulative Effects Outside the Region

Mitigation Measures **MM-W1** through **MM-W68** would reduce cumulative impacts related to water resources outside the region. However, water resources impacts outside the region would remain cumulatively considerable.

COMPARISON WITH THE NO PROJECT ALTERNATIVE

Under the No Project Alternative, the population of the SCAG region would grow by 3.9 million people, however, only the transportation projects that received federal environmental clearance by December 2010, projects in the 2011 FTIP, and projects currently under construction or right of way approval would be developed. The population distribution would follow past trends, uninfluenced by additional transportation investments.

Direct Impacts

With fewer transportation projects than the 2012-2035 RTP/SCS, the direct effects of the No Project Alternative on water resources would be reduced when compared with the 2012-2035 RTP/SCS. As the currently planned projects included in the No Project alternative (those transportation projects that would occur regardless of the 2012-2035 RTP/SCS adoption) are built, the impacts resulting from increased roadway runoff and drainage patterns would remain significant. Likewise, the impacts to groundwater infiltration caused by the increased impervious surfaces of roadway projects, and to increased flooding hazards, would remain significant. While the Plan and the No Project would result in the same total population, the more dispersed growth pattern under the No Project Alternative would result in less efficient use of water (more single-family homes with landscaping) and therefore would result in a greater per capita use of water. As the Plan's more compact growth pattern would be more water efficient, the Plans water supply impacts would be less than the No Project.

Similar to water supply, wastewater could be increased through the less efficient land use patterns. More new development would be located in areas that are not served by existing infrastructure which could result in additional impacts. The impacts to water quality would be greater under the No Project alternative as the difference in projected urbanized acreage between the Plan and No Project is significant, with the Plan converting 334 square miles of open space to urbanized land within the region. In comparison, the No Project Alternative is projected to convert 742 square miles of open space to urbanized land in the region. Because of the significant difference in urbanization and vacant land consumption, the impacts associated with urban development would be reduced in the Plan compared with the No Project alternative. Due to a more dispersed growth pattern, the No Project Alternative's impacts to both water quality and flood risk would be greater than those associated with the 2012-2035 RTP/SCS. Flooding impacts would generally be site specific although with greater consumption of vacant land, the No Project Alternative has a greater risk of locating RTP projects and/or development in flood prone areas.

Overall, it is anticipated that the Plan would result in fewer impacts to water resources because of a compact growth pattern that would result in less impervious surfaces and less demand for water.

Cumulative Impacts

Cumulatively, both the Plan and the No Project Alternative would impact water quality, groundwater recharge, flood hazards, and water supply. The No Project Alternative would accommodate the same increase in population as projected for the Plan but in a more dispersed pattern. To reduce land consumption, the Plan includes land use measures that encourage development targeted in HQTAs. These measures are largely absent in the No Project alternative. As discussed above, the large lot development associated with the No Project Alternative would result in greater demands on water supply. This increase in water consumption would pull additional water from imported sources, thereby limiting water available for other parts of the State. **Therefore, the No Project Alternative would result in greater cumulative impacts to water supply than the Plan.**

Additional impacts described above include water quality effects. These impacts would be greater under the No Project Alternative as increased impervious surface (which contributes to water quality impacts) would be greater under the No Project. This would result in greater impacts to water quality and could affect water in areas outside the SCAG region. **Therefore, cumulative water quality impacts would be greater under the No Project than the Plan alternative.**

4.0 ALTERNATIVES

CEQA requires that an EIR describe a reasonable range of alternatives to the project or to the location of the project that could feasibly avoid or lessen significant environmental impacts while substantially attaining the basic objectives of the project.[1] An EIR should also evaluate the comparative merits of the alternatives. This chapter sets forth potential alternatives to the proposed project and provides a qualitative analysis of each alternative and a comparison of each alternative to the proposed project. Key provisions of the CEQA Guidelines pertaining to the alternatives analysis are summarized below.[2]

- The discussion of alternatives shall focus on alternatives to the project including alternative locations that are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.
- The No Project Alternative shall be evaluated along with its potential impacts. The No Project Alternative analysis shall discuss the existing conditions at the time the notice of preparation is published, as well as what would reasonably be expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.
- The range of alternatives required in an EIR is governed by a "rule of reason." Therefore, the EIR must evaluate only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the proposed project.
- For alternative locations, only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR.
- An EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote and speculative.

The range of feasible alternatives is selected and discussed in a manner intended to foster meaningful public participation and informed decision making. Among the factors that may be taken into account when addressing the feasibility of alternatives (as described in CEQA Guidelines Section 15126.6[f][1]) are environmental impacts, site suitability, economic viability, availability of infrastructure, general plan consistency, regulatory limitations, jurisdictional boundaries, and whether the proponent could reasonably acquire, control, or otherwise have access to the alternative site.

An EIR must briefly describe the rationale for selection and rejection of alternatives. The lead agency may make an initial determination as to which alternatives are feasible, and, therefore, merit in-depth consideration.[3] Alternatives may be eliminated from detailed consideration in the EIR if they fail to meet project objectives, are infeasible, or do not avoid any significant environmental effects.[4]

[1]CEQA Guidelines, California Code of Regulations (CCR), Title 14, Division 6, Chapter 3, § 15126.6, 2011.
[2]*Ibid*.
[3]CEQA Guidelines, CCR, Title 14, Division 6, Chapter 3, §15126.6(f)(3), 2005.
[4]CEQA Guidelines, CCR, Title 14, Division 6, Chapter 3, §15126.6(c), 2005.

4.1 PROJECT-LEVEL IMPACTS AND OBJECTIVES

As addressed in this PEIR, the proposed project would create significant and unavoidable impacts associated with:

- **Aesthetics** (Scenic Vistas, Scenic Highways, Visual Character, Light and Glare/Shade and Shadow,)
- **Air Quality** (Criteria Pollutant Emissions and Construction Emissions)
- **Biological Resources and Open Space** (Special Status Species and Habitat, Natural Lands, Loss of Open Space)
- **Cultural Resources** (Historical Resources, Archeological Resources, Paleontological Resources and Human Remains)
- **Geology, Soils and Mineral Resources** (Seismicity, Soil Erosion, Expansive Soils, and Aggregate and Mineral Resources)
- **Greenhouse Gas Emissions** (Total GHG Emissions, and AB 32 Analysis)
- **Hazardous Materials** (Routine Transport, Upset and Accident Conditions, Contaminated Property, and Schools)
- **Land Use and Agricultural Resources** (Consistency with Plans and Policies, Division of Communities, and Agricultural and Farmlands)
- **Noise** (Construction Noise and Vibration, Land Use Compatibility, and Vibration)
- **Population, Housing and Employment** (Population and Displacement)
- **Public Services and Utilities** (Police, Fire Protection & Emergency Services Wildfire Hazards, Educational Facilities, Recreational Facilities, and Energy: Non-Renewable Energy Consumption)
- **Transportation, Traffic and Security** (Vehicle Miles Traveled and Truck Delay)
- **Water Resources** (Water Supply, Wastewater, Riparian Habitats., Groundwater, Water Quality, and Runoff/Drainage)

Objectives and Goals

As called for by the CEQA Guidelines, the achievement of project objectives must be balanced by the ability of an alternative to reduce the significant impacts of the project. The proposed project's objectives and goals include:

- Align the plan investments and policies with improving regional economic development and competitiveness
- Maximize mobility and accessibility for all people and goods in the region
- Ensure travel safety and reliability for all people and goods in the region
- Preserve and ensure a sustainable regional transportation system
- Maximize the productivity of our transportation system
- Protect the environment and health for our residents by improving air quality and encouraging active transportation (non-motorized transportation, such as bicycling and walking)
- Actively encourage and create incentives for energy efficiency, where possible
- Encourage land use and growth patterns that facilitate transit and non-motorized transportation; and
- Maximize the security of the regional transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies.

A feasible alternative must meet most if not all of these project objectives. In addition, while not specifically required under CEQA, other parameters may be used to further establish criteria for selecting alternatives such as adjustments to phasing, and other "fine-tuning" that could shape feasible alternatives in a manner that could result in reducing identified environmental impacts.

4.2 ALTERNATIVES TO THE PROPOSED PROJECT

The CEQA statute, the CEQA Guidelines, and related recent court cases do not specify a precise number of alternatives to be evaluated in an EIR. Rather, "the range of alternatives required in an EIR is governed by the rule of reason that sets forth only those alternatives necessary to permit a reasoned choice."[5] At the same time, Section 15126.6(b) of the CEQA Guidelines requires that "...the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project" and Section 15126.6(f) requires, "The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project." Accordingly, alternatives that would not address potentially significant effects are not considered herein. However, the CEQA Guidelines require that a "No Project" alternative must be included and, if appropriate, an alternative site location should be analyzed.[6] Other project alternatives may involve a modification of the proposed land uses, density, or other project elements at the same project location.

Alternatives should be selected on the basis of their ability to attain all or most of the basic objectives of the project while reducing the project's significant environmental effects. The CEQA Guidelines state that "...[t]he EIR should briefly describe the rationale for selecting alternatives to be discussed [and]...shall include sufficient information to allow meaningful evaluation, analysis and comparison with the proposed project."[7] The feasibility of the alternatives is another consideration in the selection of alternatives. The CEQA Guidelines state that "[a]mong the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations [and] jurisdictional boundaries..."[8] Also, "[t]he range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making."[9] Alternatives that are considered remote or speculative, or whose effects cannot be reasonably predicted do not require consideration. Therefore, feasibility, the potential to mitigate significant project-related impacts, and reasonably informing the decision-maker are the primary considerations in the selection and evaluation of alternatives.

The following alternatives are analyzed in this PEIR; they represent a reasonable range and bracket the range of potential impacts. The No Project Alternative is required by CEQA; the 2008 RTP represents what could occur under the previous RTP (with updates to population information); and the Envision 2 alternative represents enhancements to the Plan that are anticipated to reduce some impacts associated with the Plan:

Alternative 1 – No Project Alternative. The No Project Alternative is required by Section 15126.6(e)(2) of the CEQA Guidelines and assumes that the proposed project would not be implemented. The No Project Alternative allows decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. However, "no project" does not necessarily mean that development on the project site will be prohibited. The No Project Alternative includes "what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" (CEQA Section 15126.6[e][2]). For purposes of this document, the No Project Alternative includes only those transportation projects that are included in the first year of the previously conforming transportation plan and/or TIP, or have completed environmental review by December 2010. These reasonably foreseeable projects fulfill the definition of the CEQA mandated "No Project Alternative." The growth scenario included in the No Project Alternative is based on 2008 RTP local input which was then adjusted to reflect 2012-2035 RTP/SCS regional population, housing and jobs totals.

[5]Section 15126.6(f).
[6]Section 15126.6(e) and Section 15126(f)(2).
[7]Section 15126.6(e) and Section 15126(f).
[8]Section 15126.6(f)(1).
[9]Section 15126.6(f).

Alternative 2 – Modified 2008 RTP Alternative. The Modified 2008 RTP Alternative is an update of the adopted 2008 RTP to reflect the most recent growth estimates and transportation planning decisions and assumptions. This alternative does not include urban form strategies included within the SCS, but includes all of the modifications and projects in the 2008 RTP through RTP Amendment 4. The growth scenario for the Modified 2008 RTP Alternative is a combination of local input and existing general plan and land use data provided by local jurisdictions.

Alternative 3 – Envision 2 Alternative. The Envision 2 Alternative builds on the enhanced density and ideas of the SCS as described in the Plan and goes further. It includes far more aggressive densities than the 2012-2035 RTP/SCS, especially around High Quality Transit Areas (HQTAs), increases mobility through additional transportation investments, reduces emissions, and limits the development of single-family housing that would be built in the region. This builds off of the 2008 RTP Alternative also called Envision 2. The Envision 2 transportation network is similar to the Plan network with minor changes to goods movement and transit projects. The growth network associated with Envision 2 maximizes urban centers, TODs and HQTAs. It also includes a more progressive jobs/housing distribution optimized for TOD and infill.

The summary comparison of major impact categories of the project alternatives and the proposed project is included in **Table 4-1**.

TABLE 4-1: COMPARISON OF ALTERNATIVES TO THE PROPOSED PROJECT				
Environmental Issue	**Project Impact**	**Alternative 1 No Project Alternative**	**Alternative 2 Modified 2008 RTP Alternative**	**Alternative 3 Envision 2 Alternative**
AESTHETICS				
Scenic Vistas	Significant and Unavoidable	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Less (Significant and Unavoidable)
Scenic Highways	Significant and Unavoidable	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Less (Significant and Unavoidable)
Visual Character	Significant and Unavoidable	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Less (Significant and Unavoidable)
Light and Glare/Shade and Shadow	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Less (Significant and Unavoidable)
AIR QUALITY				
Criteria Pollutant Emissions	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Change in Risk Levels Adjacent to Freeways	Less Than Significant	Greater (Less Than Significant)	Greater (Less Than Significant)	Similar (Less Than Significant)
Increased Population adjacent to freeways and railways	Less Than Significant	Greater (Less Than Significant)	Greater (Less Than Significant)	Similar (Less Than Significant)
Construction Emissions	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Cumulative Impacts	Less than significant	Similar (Less Than Significant)	Similar (Less Than Significant)	Similar (Less Than Significant)
BIOLOGICAL RESOURCES AND OPEN SPACES				
Sensitive Species/Habitat	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Habitat Loss and Fragmentation	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Natural Lands	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Direct Construction Effects to Biological Resources	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Indirect Construction Effects to Biological Resources	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)

TABLE 4-1: COMPARISON OF ALTERNATIVES TO THE PROPOSED PROJECT				
Environmental Issue	**Project Impact**	**Alternative 1 No Project Alternative**	**Alternative 2 Modified 2008 RTP Alternative**	**Alternative 3 Envision 2 Alternative**
CULTURAL RESOURCES				
Historical Resources	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)
Archeological Resources	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Paleontological Resources	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Human Remains	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
GEOLOGY, SOILS AND MINERAL RESOURCES				
Seismicity	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Soil Erosion	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Expansive Soils	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Aggregate and Mineral Resources	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)
GREENHOUSE GAS EMISSIONS				
Total GHG Emissions	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
AB 32 Analysis	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
SB 375 Analysis	Less Than Significant	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Less Than Significant)
HAZARDOUS MATERIALS				
Routine Transport, Use or Disposal of Hazardous Materials	Less Than Significant	Greater (Less Than Significant)	Greater (Less Than Significant)	Similar (Less Than Significant)
Upset and Accident Conditions	Significant and Unavoidable	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Less (Significant and Unavoidable)
Schools	Significant and Unavoidable	Less (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Less (Significant and Unavoidable)
Disturbance of Contaminated Property During Construction	Less Than Significant	Greater (Less Than Significant)	Similar (Less Than Significant)	Similar (Less than Significant)

TABLE 4-1: COMPARISON OF ALTERNATIVES TO THE PROPOSED PROJECT				
Environmental Issue	**Project Impact**	**Alternative 1 No Project Alternative**	**Alternative 2 Modified 2008 RTP Alternative**	**Alternative 3 Envision 2 Alternative**
LAND USE & AGRICULTURAL RESOURCES				
Consistency with Plans and Policies	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Divide a Community	Significant and Unavoidable	Less (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Forest, Agricultural and Farm Lands	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
NOISE				
Construction Noise and Vibration	Significant and Unavoidable	Less (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Land Use Compatibility	Significant and Unavoidable	Less (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Vibration	Significant and Unavoidable	Less (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
POPULATION, HOUSING, & EMPLOYMENT				
Population Growth	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Displacement	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
PUBLIC SERVICES AND UTILITIES				
Police, Fire and Emergency Services	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Wildfire Hazards	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Educational Facilities	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Recreational Facilities	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Solid Waste Disposal and Transfer Facilities	Significant and Unavoidable	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Less (Significant and Unavoidable)
Utility Lines	Less Than Significant	Similar (Less Than Significant)	Similar (Less Than Significant)	Similar (Less Than Significant)
Non-Renewable Energy Consumption	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)

TABLE 4-1: COMPARISON OF ALTERNATIVES TO THE PROPOSED PROJECT				
Environmental Issue	**Project Impact**	**Alternative 1 No Project Alternative**	**Alternative 2 Modified 2008 RTP Alternative**	**Alternative 3 Envision 2 Alternative**
TRANSPORTATION, TRAFFIC & SECURITY				
Vehicle Miles Traveled	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Vehicle Hours in Delay	Less than significant	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)
Truck Delay	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)
Worker Commute	Less Than Significant	Greater (Less Than Significant)	Greater (Less Than Significant)	Less (Significant and Unavoidable)
Transportation System Fatality Rate	Less Than Significant	Greater (Less Than Significant)	Greater (Less Than Significant)	Less (Less Than Significant)
Transportation System Injury Rate	Less Than Significant	Greater (Less Than Significant)	Greater (Less Than Significant)	Less (Less Than Significant)
WATER RESOURCES				
Water Supply	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Wastewater	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Less (Significant and Unavoidable)
Riparian Habitats and Waters	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Groundwater	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Water Quality	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Runoff/Drainage	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
CUMULATIVE IMPACTS				
Aesthetics	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Air Quality	Significant and Unavoidable	Greater Significant and Unavoidable	Greater Significant and Unavoidable	Similar Significant and Unavoidable
Biological Resources and Open Space	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Cultural Resources	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)
Geology, Soils and Mineral	Significant and Unavoidable	Similar	Similar	Similar

TABLE 4-1: COMPARISON OF ALTERNATIVES TO THE PROPOSED PROJECT

Environmental Issue	Project Impact	Alternative 1 No Project Alternative	Alternative 2 Modified 2008 RTP Alternative	Alternative 3 Envision 2 Alternative
Resources		(Significant and Unavoidable)	(Significant and Unavoidable)	(Significant and Unavoidable)
Greenhouse Gas Emissions	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Hazardous Materials	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Land Use, Forest Lands and Agricultural Resources	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Noise	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Population, Housing and Employment	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Public Services and Utilities	Significant and Unavoidable	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Transportation, Traffic and Security	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Similar (Significant and Unavoidable)
Water Resources	Significant and Unavoidable	Greater (Significant and Unavoidable)	Greater (Significant and Unavoidable)	Less (Significant and Unavoidable)

SOURCE: TAHA, 2011.

ANALYSIS OF ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

Aesthetics

The No Project Alternative includes fewer transportation projects than the Plan and would have a lesser impact in terms of obstructing views and scenic resources, creating contrasting visual elements and adding visual elements to existing natural, rural, and open space areas. The No Project Alternative would not affect any State Scenic Highways or vista points.

The No Project Alternative is expected to accommodate the same increase in total population, households and jobs as the Plan. However, the Plan includes strategies to focus growth in HQTAs which would help reduce the consumption and disturbance of natural lands and reduce impacts to aesthetics and views. Under the No Project Alternative, these land use strategies may not occur – although individual jurisdictions may still seek to reduce the urban footprint through their general plans. The Plan also includes transportation improvements that facilitate access to undeveloped lands, making those lands more attractive for development than under the No Project Alternative. However, the Plan includes policies to dissuade such encroachment on open space and vacant lands and is anticipated to result in far fewer impacts. The No Project Alternative impacts would be greater than the Plan impacts because of the increased consumption of open space and vacant land (742 square miles as opposed to 334 square miles under the Plan) that would result in loss of scenic resources and changes in visual character. As shade/shadow and glare impacts typically occur in urban areas, these impacts would be reduced under the No Project Alternative. In addition, the No Project Alternative would result in greater light and glare impacts as many of the transportation projects would occur in areas that are currently undeveloped or underdeveloped and would introduce new sources of light and materials that cause glare.

Air Quality, including Cancer Risk and Other Health Incidences Related to VMT

Table 4-2 compares the No Project Alternative criteria pollutant emissions by county to the Plan emissions. The Plan would result in fewer emissions than the No Project Alternative with three exceptions. NO_X emissions would not change in Imperial County and would increase slightly in Riverside County and Ventura County. Despite small NO_X increases in the previously mentioned counties, the Plan overall would improve regional emissions compared to the No Project Alternative.

Tables 4-3 and **4-4** show the residential and workplace cancer risk, respectively. The maximum residential and workplace risks due to vehicle operation on all freeway segments are much higher under existing (2012) conditions than under the No Project Alternative. The declines in cancer risk across all freeway segments are the result of continued decreases in per-vehicle mile fleet emissions projected to occur due to continued emission control technology improvements in new vehicles. When compared to the Plan, the No Project Alternative would result in a higher risk in all counties except for Orange and Imperial Counties. Regardless, the total regional risk would be lower under the Plan than the No Project Alternative. In addition, it is estimated that the Plan would result in 293,633 annual health incidences leading to $4,952,996,222 spent on healthcare. This is a 24 percent reduction when compared to the 2035 baseline. Under the No Project Alternative, no new transportation investments would be made, beyond those that are currently programmed. As a result, fewer transportation projects would be built than under the Plan resulting in less construction emissions. However, construction emissions would still likely exceed the significance thresholds established in the CEQA Guidelines. Similar to the Plan, construction emissions would result in a significant short-term impact. Projected long-term emissions are considered to be cumulatively significant if they are not consistent with the local air quality management plans and state implementation plans. As previously indicated, regional emissions under the No Project Alternative are greater than under the Plan. The Plan conforms to the local air quality management plans, and cumulative impacts are considered less than significant. Unlike the Plan, the No Project Alternative may not conform to the local air quality management plans and could have a significant cumulative impact.

TABLE 4-2: CRITERIA POLLUTANT EMISSIONS BY COUNTY – NO PROJECT ALTERNATIVE (2035) VS PLAN (2035)

County		Tons/Day								
		ROG Summer	ROG Annual	NO_x Summer	NO_x Annual	NO_x Winter	CO Winter	PM10 Annual	PM2.5 Annual	SO_x Annual
Los Angeles /a/	No Project	43	42	71	72	76	321	14	9	1
	Plan	42	41	70	71	75	299	12	8	1
	Difference	(1)	(1)	(1)	(1)	(1)	(22)	(1)	(1)	0
Imperial	No Project	4	3	9	9	9	25	1	1	0
	Plan	4	3	9	9	9	24	1	1	0
	Difference	0	0	0	0	0	0	0	0	0
Orange	No Project	15	14	19	19	20	102	4	3	0
	Plan	14	14	19	19	20	96	4	3	0
	Difference	0	0	0	0	0	(6)	0	0	0
Riverside /b/	No Project	15	14	35	34	36	119	6	4	1
	Plan	15	13	35	35	36	114	5	3	1
	Difference	0	0	0	0	0	(6)	0	0	0
San Bernardino /c/	No Project	15	14	40	39	40	123	5	4	1
	Plan	15	13	37	37	38	114	5	3	0
	Difference	1	(1)	(2)	(2)	(2)	(9)	1	0	0
Ventura	No Project	4	4	5	6	6	28	1	1	0
	Plan	4	4	5	6	6	27	1	1	0
	Difference	0	0	0	0	0	(1)	0	0	0

Note: 2012 modeled conditions are used to approximate 2011 conditions; in the professional opinion of SCAG modelers 2012 conditions are similar if not the same as 2011 conditions.
/a/ Los Angeles County excludes Antelope Valley
/b/ Riverside County includes the SCAB, MDAB and Coachella Valley portions
/c/ San Bernardino County includes the SCAB and MDAB portions
SOURCE: SCAG Transportation Modeling, 2011.

TABLE 4-3: MAXIMUM CANCER RISK BASED ON RESIDENTIAL EXPOSURE TO VEHICLE OPERATION BY PLANNING SCENARIO AND FREEWAY CORRIDOR – NO PROJECT ALTERNATIVE

Planning Scenario	Maximum Cancer Risk Over 70-Year Residential Exposure (in one million)							
	I-405 (Orange)	I-710 (Los Angeles)	I-8 (Imperial)	SR 60 (San Bernardino)	SR 91 (Riverside)	US 101 (Ventura)	SR 60 (Los Angeles)	I-15 (San Bernardino)
Existing Conditions (2012)	1,080	1,040	503	1,770	1,960	372	1,470	811
No Project (2035)	442	734	385	735	943	201	562	368
Plan (2035)	462	475	399	714	668	199	536	354

SOURCE: Sierra Research, 2011.

TABLE 4-4: MAXIMUM CANCER RISK BASED ON WORKPLACE EXPOSURE TO VEHICLE OPERATION BY PLANNING SCENARIO AND FREEWAY CORRIDOR – NO PROJECT ALTERNATIVE

Planning Scenario	Maximum Cancer Risk Over 70-Year Residential Exposure (in one million)							
	I-405 (Orange)	I-710 (Los Angeles)	I-8 (Imperial)	SR 60 (San Bernardino)	SR 91 (Riverside)	US 101 (Ventura)	SR 60 (Los Angeles)	I-15 (San Bernardino)
Existing Conditions (2012)	163	158	76	269	297	56	223	123
No Project (2035)	67	111	58	111	143	30	85	56
Plan (2035)	70	72	60	108	101	30	81	54

SOURCE: Sierra Research, 2011.

Biological Resources and Open Space

Under the No Project Alternative, fewer areas would be impacted by excavation and construction activities related to transportation projects as compared to the Plan. However, anticipated development under the No Project Alternative would consume 742 square miles of undeveloped (vacant) land, whereas the Plan would consume 334 square miles of undeveloped land. While the No Project Alternative would reduce the number of transportation projects built in the SCAG region, it would result in greater vacant land consumption, including sensitive species habitat and natural lands, that would, in turn, increase the impacts to biological resources and open space, such as habitat loss and fragmentation. Therefore, the No Project Alternative impacts to biological resources and open space would be greater than the impacts from the 2012-2035 RTP/SCS. Additionally, because the No Project Alternative would consume greater amounts of vacant land and result in a more spread out growth pattern which would result in the development of lands that contain biological resources and open space, the No Project Alternative's cumulative impacts to biological resources and open space would be greater than those of the 2012-2035 RTP/SCS.

Cultural Resources

Under the No Project Alternative, fewer developed areas would be impacted by excavation and construction activities related to transportation projects as compared to the Plan. However, growth patterns under the No Project Alternative would consume 742 square miles of undeveloped (vacant) land whereas the Plan would consume 334 square miles of undeveloped land. While the No Project Alternative would reduce the number of transportation projects built in the SCAG region, it would result in greater vacant land consumption that could, in turn, increase the chance to uncover a greater number of previously undisturbed resources. Therefore, the No Project Alternative impacts to cultural resources would be greater than the impacts from the 2012-2035 RTP/SCS. Additionally, because the No Project Alternative would consume greater amounts of vacant land and result in a more spread out growth pattern which could result in the development of lands that contain previously undisturbed and undiscovered archaeological, paleontological, or human remains, the No Project Alternative's cumulative impacts to cultural resources would be greater than those of the 2012-2035 RTP/SCS. The Plans greater focus on urban areas could result in greater impacts to historic buildings, although many jurisdictions have policies and ordinances in place to protect historic resources.

Geology and Soils

Implementation of the 2012-2035 RTP/SCS would result in a greater amount of transportation projects and would increase the amount of transportation infrastructure that would be subject to risk as a result of surface rupture, ground-shaking liquefaction, and landsliding and other risks associated with seismic events. The No Project Alternative would result in the construction of approximately 68,040 new lane miles compared with over 74,297 new lane miles in the 2012-2035 RTP/SCS. Impacts related to geologic and seismic resources would be similar to the Plan under the No Project Alternative because the population would be the same and entire region is subject to seismic risk. The reduced amount of RTP projects would be expected to occur under the No Project Alternative could result in a decrease in the amount of aggregate and mineral resources demand in the region. However as more land would be consumed under the No Project Alternative (742 square miles compared to 334 square miles under the Plan), more local access roads are anticipated to be needed. The more compact development pattern under the Plan could use less aggregate per capita as more compact development is more efficient. On balance it is anticipated that the No Project Alternative would result in greater impacts because dispersed development is less efficient in its use of aggregate as compared to a more compact development pattern.

Greenhouse Gas Emissions

Table 4-5 compares the No Project Alternative greenhouse gas (GHG) emissions for residential and commercial construction and energy demand and all mobile sources by county to the Plan emissions. It is estimated (based on simplified gross estimates of construction, energy use and water use) that in 2020 the Plan would result in six million metric tons less of GHG emissions than the No Project Alternative. In 2035, the Plan would result in 13 million metric tons less of GHG emissions than the No Project Alternative. The Plan would improve regional GHG emissions compared to the No Project Alternative.

TABLE 4-5: GREENHOUSE GAS EMISSIONS BY COUNTY – NO PROJECT ALTERNATIVE

	CO_2e Emissions (Million Metric Tons per Year)			
Area and Source	**Future No Project (2020)**	**Plan (2020)**	**Future No Project (2035)**	**Plan (2035)**
IMPERIAL COUNTY				
Construction	0.01	0.01	0.01	0.01
Transportation	1.7	1.7	2.4	2.4
Building Energy	0.56	0.41	0.62	0.39
Water-Related Energy	0.05	0.03	0.06	0.02
Subtotal	2.3	2.2	3.1	2.8
LOS ANGELES COUNTY				
Construction	0.16	0.16	0.15	0.15
Transportation	43	41	48	44
Building Energy	23	23	22	21
Water-Related Energy	2.1	2.2	1.9	1.9
Subtotal	68	66	72	67
ORANGE COUNTY				
Construction	0.04	0.04	0.04	0.04
Transportation	14	13	15	14
Building Energy	6.2	6.0	5.9	5.6
Water-Related Energy	0.62	0.64	0.57	0.59
Subtotal	21	20	22	20
RIVERSIDE COUNTY				
Construction	0.11	0.11	0.11	0.11
Transportation	14	14	19	18
Building Energy	5.5	4.8	6.5	4.9
Water-Related Energy	0.48	0.42	0.57	0.38
Subtotal	20	19	26	23
SAN BERNARDINO COUNTY				
Construction	0.07	0.07	0.07	0.07
Transportation	14	13	19	17
Building Energy	4.9	4.4	5.4	4.3
Water-Related Energy	0.41	0.38	0.48	0.34
Subtotal	19	18	25	22
VENTURA COUNTY				
Construction	0.01	0.01	0.01	0.01
Transportation	3.7	3.7	4.1	3.9
Building Energy	2.0	1.9	2.0	1.8
Water-Related Energy	0.17	0.17	0.17	0.09
Subtotal	5.9	5.8	6.3	5.8
Total Emissions	**137**	**131**	**154**	**141**
Plan (2020) Compared to Future No Project (2020)				**(6)**
Plan (2035) Compared to Future No Project (2035)				**(13)**

Note: The estimation of GHG emissions does not include the following sources: solid waste, aircraft, watercraft, trains, and industrial process sources. Total emissions resulting from construction, energy and water use are gross estimates based on simplified assumptions for purposes of this programmatic analysis.
SOURCE: TAHA, 2011; SCAG Transportation Modeling, 2011; Calthorpe, 2011.

AB 32 calls for GHG emissions to be reduced to 1990 levels by 2020. In the absence of reliable 1990 GHG emissions estimates, ARB recommends an equivalent metric of 15 percent below 2005 GHG emissions. Because the Scoping Plan time horizon is limited to 2020, analysis is presented for the year 2020 only, not for 2035 or 2050. As shown in **Table 4-6**, GHG emissions in 2020 are expected to be greater than the Plan and greater than the GHG emissions target set by AB 32. Because SCAG has no control over many future emissions factors (e.g., energy and water demand), SCAG made extremely conservative assumptions regarding these factors. Similar to the Plan, the No Project Alternative could not achieve the AB 32 targets alone.

TABLE 4-6: GREENHOUSE GAS AB 32 ANALYSIS– NO PROJECT ALTERNATIVE

Scenario	CO_2e Emissions (Million Metric Tons per Year)
Plan vs. 2005 Baseline Change in Emissions (AB 32 Target is 15% below 2005 levels by 2020)	1%
No Project vs. 2005 Baseline Change in Emissions (AB 32 Target is 15% below 2005 levels by (2020)	3%

Note: The estimation of GHG emissions does not include the following sources: solid waste, waterborne navigations, trains, aviation, agricultural uses, ozone depleting substances commercially produced (e.g., hydrofluorocarbons), and industrial processes.
SOURCE: TAHA, 2011, SCAG Transportation Modeling, 2011; Calthorpe, 2011.

As described in the Regulatory Setting above, SB 375 requires ARB to develop regional CO_2 emission reduction targets, compared to 2005 emissions, *for cars and light trucks only* for 2020 and 2035 for each of the State's MPOs. Significantly, where SCAG has control over transportation network improvements and growth distribution as part of its Plan, it is able to meet the SB 375 target with the SCS. **Table 4-7** shows that regional per capita GHG emissions would increase under the No Project Alternative. As a result, the No Project Alternative would not achieve the SB 375 emissions targets (as compared to the Plan which would meet the targets).

TABLE 4-7: SB 375 ANALYSIS – NO PROJECT ALTERNATIVE

County	Baseline (2005)	Future No Project (2020)	Plan (2020)	Future No Project (2035)	Plan (2035)
Resident Population (per 1,000) /a/	17,161	19,344	19,346	21,769	21,773
CO_2 Emissions (per 1,000 Tons) /b/	204.7	220.6	211.4	249.2	222.9
Per Capita Emissions (Pounds)	23.9	22.8	21.9	22.9	20.5
Percent Difference from Plan (2020) to Baseline (2005)					(8%)
Percent Difference from Plan (2035) to Baseline (2005)					(14%)
(Additional Reductions from 4D Model) /c/					(2%)
Total Reductions					(16%)
Percent Difference from Future No Project (2020) to Baseline (2005)					(4%)
Percent Difference from Future No Project (2035) to Baseline (2005)					(4%)

/a/ Population estimates exclude the group quarter population (e.g., dorms, prisons, long term hospitals).
/b/ Emissions are from passenger vehicles and light-duty trucks.
/c/ For description of 4D Model, see SCAG NHTS Model Documentation Report
SOURCE: SCAG Transportation Modeling, 2011.

Hazardous Materials

Due to the reduced number of transportation projects and increased number of transportation gaps, the No Project Alternative could result in a reduced movement of hazardous materials around the SCAG region, resulting in fewer associated risks. The No Project Alternative would result in the construction of approximately 68,040 new lane miles compared with over 74,297 new lane miles in the 2012-2035 RTP/SCS. As a result, new transportation projects in the No Project Alternative would be within a quarter-mile radius of 147 K-12 schools, which would be 394 less schools than under the Plan. Under the No Project

Alternative, new highway, transit, and freight rail projects would be within 150 feet of 359 acres of residential and 266 acres of commercial land uses. This is far fewer acres of potentially affected neighborhoods and communities than under the 2012-2035 RTP/SCS. Because there would be fewer projects built, the No Project Alternative could result in a smaller increase in the movement of hazardous materials around the SCAG region, resulting in fewer associated risks. However, without the transportation system improvements incorporated in the 2012-2035 RTP/SCS, vehicle miles travelled (VMT) and vehicles in delay (VHD) would increase more by 2035 for the No Project Alternative than for the project. Thus, there would be more opportunities for accidents with vehicles transporting hazardous materials in the No Project Alternative than in the Plan. Also, with fewer new roadways constructed, hazardous materials transport would be concentrated on existing routes, and could not be diverted to dedicated lanes or grade-separated from automobile traffic. Construction related to improvements and other projects in the 2012-2035 RTP/SCS could involve construction on or adjacent to a greater number of potentially contaminated sites than under the No Project Alternative. In addition, the Plan assumes the use of urban form strategies that would encourage greater property reuse and more infill development than under the No Project Alternative. Thus, it is more likely that previously contaminated sites would be encountered under the Plan than the No Project Alternative.

With the construction of fewer new lane miles and other transportation projects in the No Project Alternative compared to the Plan, more transportation demand could be transferred to surrounding counties, and therefore, more hazardous materials transportation could potentially be facilitated in those counties. The No Project Alternative could have fewer adverse cumulative hazardous materials impacts than the Plan. Anticipated development patterns under the No Project Alternative would consume far greater open space and vacant lands and possibly greater farming lands. Farming lands are frequently contaminated by past pesticide use. Required testing and clean up of contaminated lands should address any potential hazards.

Land Use and Agricultural Resources

The No Project Alternative includes fewer transportation projects than the 2012-2035 RTP/SCS and does not include any land use strategies. It would have a lesser potential for conflicting with general plans as the only growth strategies that would occur would be local land use controls. It also would have less of an influence on the patterns of urbanization in the region. Nonetheless, urbanization with significant potential for land use incompatibility would occur. The No Project Alternative would result in a more dispersed land use pattern. The No Project Alternative would consume an estimated 742 square miles of open space/ vacant land, while the Plan would consume only 334 square miles of open space/vacant land. Therefore, the No Project Alternative would have greater impacts related to conversion of farmland and agricultural lands. The No Project Alternative would likely have similar or possibly greater impact on land use incompatibility because redevelopment in existing communities would still occur and more land in general would be impacted.

The No Project Alternative contains fewer transportation investments than the Plan Alternative. Consequently, there would be fewer places where businesses and homes would be displaced by transportation projects and fewer places where communities would be disrupted. The No Project Alternative would occur within 150 feet of 391 acres of business land uses (commercial, industrial and extraction land uses) and 359 acres of residential land uses (rural, low, and medium to high density housing land uses). For the Plan 5,942 acres of business land uses and about 3,236 acres of residential land uses would be affected by transportation projects. The impacts of transportation projects alone under the Plan would result in greater impacts as compared to the No Project Alternative. Development impacts are less clear, since under the Plan development would be concentrated in urban areas. In contrast, in the No Project Alternative land uses would change to a much greater extent in undeveloped areas.

The No Project Alternative is expected to accommodate the same increase in total population as the proposed Plan. However, the Plan includes land use measures that would help reduce the consumption and

disturbance of agricultural lands, vacant lands, open space, and recreation lands. These policies and mitigation strategies are absent in the No Project Alternative. Under the No Project Alternative, up to approximately 742 square miles or 474,900 acres of vacant, open space and agricultural lands would be consumed, compared 334 square miles or 213,800 acres under the Plan. The more dispersed land use pattern of the No Project Alternative would consume more vacant land, but also could impact areas outside the region through setting a precedent for the conversion of non-urban lands. This would happen as development spreads out along existing freeways or similar methods of expansion. Under the No Project Alternative land use changes could affect jurisdictions outside the SCAG region, by setting a precedent for and/or inducing consumption of agricultural lands; such impacts would be cumulatively considerable. The Plan would decrease congestion potentially making it easier for people to live and work outside the region, thereby inducing land uses changes outside the region, these impacts also could be cumulatively considerable.

Noise

Construction noise and vibration impacts under the No Project Alternative would be less than those of the Plan. With fewer transportation projects being built under the No Project Alternative, there would be substantially less construction noise and vibration affecting sensitive receptors. Because fewer transportation projects would be built, construction impacts due to activities such as grading, power tools, and earth moving would be reduced.

Through the construction of transportation projects, and increases in traffic volume and speed, the 2012-2035 RTP/SCS projects would create substantially more noise than the No Project Alternative. The same level of population, household and job growth is anticipated under the No Project Alternative as under the Plan, so similar amounts of development are anticipated. However under the Plan uses are anticipated to be more compact (more multi-family as compared to single-family housing), and will therefore result in more intense areas of development and higher noise levels in the HQTAs. If the Plan is not implemented, the levels of cumulative ambient noise would be less than with the Plan in existing communities as a result of fewer sources and reduced speeds. Under the Plan, transportation noise would similarly be concentrated in HQTAs as compared to the No Project Alternative.

The No Project Alternative could have a significant impact on noise and vibration outside the region. Cumulative transportation noise would increase outside the region partially as a result of population, household and job growth. This ambient noise increase would be related to various sources including, aircraft overflights, port noise, ship horns, railroads, as well as freeway, arterial and transit noise. As such, the No Project Alternative would have similar cumulative noise impact as the Plan.

Population, Housing and Employment

The No Project Alternative is expected to accommodate the same increase in total population, housing, and employment as the Plan. Therefore, the No Project Alternative would result in the same population growth impacts as the Plan.

The No Project Alternative contains fewer transportation projects than the 2012-2035 RTP/SCS. Consequently, there would be fewer places where businesses and homes would be displaced and fewer places where communities would be disrupted. The GIS analysis of existing land use data shows that the freeway, transit, and freight rail projects in the No Project Alternative would occur within 150 feet of 5,740 acres of business land uses (commercial, industrial and extraction land uses) and 2,540 acres of residential land uses (rural, low, and medium to high density housing land uses). For the Plan 7,800 acres of business land uses and 6,500 acres of residential land uses would be affected by transportation projects. Therefore, the Plan impacts would be greater than the No Project Alternative.

The No Project Alternative is expected to accommodate the same increase in total population, housing, and employment as the Plan. It is anticipated that more development would occur in urban areas under the Plan, therefore more displacement could occur under the Plan. The Plan includes additional transportation improvements that would facilitate access to currently vacant lands that would be less accessible with the No Project Alternative. This improved accessibility under the Plan could help facilitate population and economic growth in areas of the region that are currently not undeveloped and under developed. While the Plan could encourage growth in previously undeveloped areas, land use strategies would aggressively seek to reduce consumption of vacant, open space/recreation and agricultural lands. The No Project Alternative could consume about 742 acres of vacant, open space/recreation and agricultural lands, while the 2012-2035 RTP/SCS would consume about 334 acres. Although the Plan and the No Project Alternative would result in a different distribution of consumed land, they would result in the same total number of population, households, and employment. Therefore, the No Project Alternative's cumulative impacts to population, households, and employment would be approximately the same as those of the 2012-2035 RTP/SCS.

Public Services and Utilities

Fire and Police Protection and Emergency Services

The congestion that results because of a lack of additional transportation improvement projects and the population distribution would result in emergency vehicle response times that are worse in the No Project Alternative than under the Plan. Traffic delay is measured in vehicle hours travelled, or VHT. Under the Plan, total daily VHT in the SCAG region is expected to grow from 3,277,000 person hours in 2011 to 4,357,000 person hours by 2035. Under the No Project Alternative, VHT would increase to 6,015,000 person hours by 2035. Therefore, implementation of the Plan would reduce traffic delay by approximately 38 percent as compared to the No Project Alternative, thereby reducing delays in emergency vehicle response times.

Under the No Project Alternative, it is anticipated that 83,990 households would be exposed to extreme wildfire threats; whereas under the 2012-2035 RTP/SCS, the number would be reduced to 71,553. This would be a 14 percent decrease in households exposed to extreme wildfire threats, as measures to reduce wildfire threats are implemented with planned 2012-2035 RTP/SCS projects. Therefore, the No Project Alternative would result in greater impacts as compared to the proposed Plan.

The 2035 population would be the same under the No Project Alternative as under the Plan. Therefore, the cumulative need for additional emergency personnel to accommodate the population would be the same under The No Project Alternative and the Plan. Under the No Project Alternative, new growth would be spread over about 474,880 acres of vacant, open space/recreational and agricultural lands compared to about 213,760 under the Plan. Thus greater extension of fire and police protection and emergency services would be needed under the No Project Alternative.

Educational Facilities

The No Project Alternative would result in similar impacts related to educational facilities as under the Plan. The No Project Alternative assumes the continuation of development patterns that the region has experienced over the past decades, and the same future population is expected. Therefore, the demand for educational facilities would remain the same under the No Project Alternative as under the Plan.

Recreational Facilities

The No Project Alternative includes fewer transportation projects than the Plan and does not include land use strategies beyond those put in place by local jurisdictions. Thus, the No Project Alternative would be expected to directly consume or disturb fewer acres of agricultural lands and open space than the Plan.

The No Project Alternative is expected to accommodate the same increase in total population as the Plan. The Plan includes additional transportation improvements that facilitate access to agricultural lands, vacant lands, open space, and recreation lands that would be less accessible with the No Project Alternative. However, the Plan also includes land use measures that would help reduce the consumption and disturbance of agricultural lands, vacant lands, open space, and recreation lands. These mitigation measures are potentially absent in the No Project Alternative. The No Project Alternative is expected to result in the continuation of past land use development patterns, which result in more growth in undeveloped land and open spaces. Under the No Project Alternative, by 2035, up to approximately 474,900 acres of vacant, open space and agricultural lands would be consumed, compared to 213,800 under the Plan. Therefore, the No Project Alternative would result in greater impacts to recreational lands than the Plan.

Solid Waste and Transfer Facilities

The No Project Alternative would result in the same or fewer impacts related to solid waste disposal and transfer facilities as compared to the Plan. With fewer transportation projects being constructed, the need for solid waste disposal facilities for construction related material would be less under the No Project Alternative than under the Plan.

The need for additional solid waste services to accommodate the population would be the same under the No Project Alternative as in the Plan. Under the No Project Alternative new growth would be spread over about 742 square miles of vacant, open space/recreational and agricultural lands compared to about 334 under the Plan. Thus greater extension of solid waste transport and disposal infrastructure would be needed under the No Project Alternative. Green waste generation could also increase under the No Project Alternative because of the greater expanse of land that is urbanized with single-family homes and other low-density landscaped development.

Energy

The No Project Alternative would result in greater impacts to energy as compared to the Plan. Because the No Project Alternative contains fewer transportation projects than the Plan, the potential to disrupt or sever underground utility lines would be less in the No Project Alternative than in the Plan. The No Project Alternative would result in the construction of approximately 300 new lane miles compared with approximately 6,000 new lane miles in the Plan. However, the total projected use of transportation fuels would be greater under the No Project Alternative. This difference would result from development under the No Project Alternative continuing the same patterns of growth that the region has experienced in past decades, relying heavily on growth in undeveloped lands at the edges of cities and beyond. The No Project Alternative would consume approximately 742 square miles of vacant land, as opposed to 334 square miles under the Plan. Therefore, the No Project Alternative would result in greater VMT and related transportation fuel consumption than the Plan, because vehicles would be traveling over nearly twice as much developed land under the No Project Alternative. By 2035, under the No Project Alternative, VMT is expected to be approximately 547 million miles per day; as compared to 517 under the Plan. In addition, scenarios that contain more mixed-use, walkable, and urban infill development, such as that under the Plan, accommodate a higher proportion of growth in more energy-efficient housing types like townhomes, apartments, and smaller single-family homes, as well as more compact commercial building types. By contrast, a large proportion of standard development, such as that which is anticipated to occur under the No Project Alternative, leads to a higher proportion of larger single -amily homes, which are typically less energy-efficient. Specifically, under

the No Project Alternative, the total building energy that is anticipated to be consumed in 2035 is approximately 604 trillion Btu, as compared with 589 trillion Btu under the Plan.

Transportation, Traffic and Security

The No Project Alternative would not include transportation and land use strategies that focus growth along existing corridors and in urbanized areas. As a result, population would be more scattered thought the region when compared to the Plan, and per capita VMT would not be reduced and other transportation metrics would not be improved. Implementation of the Plan would reduce vehicle miles of travel in 2035 from 547 million miles to 517 million miles. This constitutes a seven percent decrease from the No Project Alternative. The Plan impact would be less than the No Project impacts for VMTs.

Implementation of the Plan would reduce VHD in 2035 from 6,015 thousand vehicle-hours to 3,115 thousand vehicle-hours. This constitutes a 48 percent decrease from the No Project Alternative and includes light, medium and heavy-duty truck VHD in all six counties. The Plan impact would be less than the No Project impact for VHDs.

Implementation of the Plan would reduce heavy-duty truck VHD in 2035 from 354,000 hours to 158,000 thousand hours. This constitutes a 55 percent decrease from the No Project Alternative. The Plan impact would be less than the No Project impacts for heavy-duty truck VHD.

Implementation of the No Project Alternative would decrease the work opportunities within 45 minutes travel time by single occupancy vehicle in 2035 as compared to the Plan from 82 percent to 79 percent, would decrease the work opportunities within 45 minutes travel time by high occupancy vehicle from 77 to 68 percent, and would decrease the work opportunities within 45 minutes travel time by transit from 21 to 20 percent. The No Project Alternative would not improve the percent of work opportunities within 45 minutes travel time. The Plan impact would be less than the No Project impacts for work opportunities within 45 minutes travel time.

Implementation of the Plan would result in a system-wide daily fatality rate of 0.17 fatalities per million persons for all travel modes, a decrease of 0.01 daily fatalities per million persons when compared to the No Project Alternative rate of 0.18. Implementation of the Plan would result in a system-wide daily injury rate of 12.93 injuries per million persons for all travel modes, a decrease of 5.34 daily injuries per million persons when compared to the No Project Alternative rate of 13.67. The Plan impact would be less than the No Project impact for the transportation system fatality and injury rates.

The Plan includes transportation and land use strategies that focus growth along existing corridors and in urbanized areas, rather than allowing development of vacant, open space/recreation and agricultural lands. This compact development pattern included in the Plan would concentrate population in urban areas and encourage alternative modes of travel other than automobiles. Without the planned development patterns, vehicles miles travels, vehicle hours of delay, worker commute trips, and accident rates would be higher than under the Plan. The Plan would result in fewer cumulative impacts than the No Project Alternative.

Water Resources

Under the No Project Alternative, fewer areas would be impacted by excavation and construction activities related to transportation projects as compared to the Plan. However, growth patterns under the No Project Alternative would consume 742 square miles of undeveloped (vacant) land whereas the Plan would consume 334 square miles of undeveloped land. While the No Project Alternative would reduce the number of transportation projects built in the SCAG region, it would result in greater vacant land consumption that would, in turn, increase the amount of impervious surfaces and increase impacts to water resources. Therefore, the No Project Alternative impacts to water resources would be greater than the impacts from the 2012-2035 RTP/SCS.

Additionally, because the No Project Alternative would consume greater amounts of vacant land and result in a more spread out growth pattern which would result in the development of land, the No Project Alternative's cumulative impacts to water resources would be greater than those of the 2012-2035 RTP/SCS.

With fewer transportation projects than the 2012-2035 RTP/SCS, the direct effects of the No Project Alternative on water resources would be reduced when compared with the 2012-2035 RTP/SCS. As the currently planned projects included in the No Project alternative are built, the impacts resulting from increased roadway runoff and drainage patterns would remain significant. Likewise, the impacts to groundwater infiltration caused by the increased impervious surfaces of roadway projects, and to increased flooding hazards, would remain significant. While the Plan and the No Project would result in the same total population, the more dispersed growth pattern under the No Project Alternative would result in less efficient use of water (more single-family homes with landscaping) and therefore would result in a greater per capita use of water. As the Plan's more compact growth pattern would be more water efficient, the Plans water supply impacts would be less than the No Project.

Similar to water supply, wastewater could be increased through the less efficient land use patterns. More new development would be located in areas that are not served by existing infrastructure which could result in additional impacts. The impacts to water quality would be greater under the No Project Alternative as the projected urbanized acreage under the No Project Alternative would be greater compared to the Plan (converting 334 square miles of open space to urbanized land within the region). In comparison, the No Project Alternative is projected to convert 742 square miles of open space to urbanized land in the region. Due to a more dispersed growth pattern, the No Project Alternative's impacts to both water quality and flood risk would be greater than those associated with the 2012-2035 RTP/SCS. Flooding impacts would generally be site specific although with greater consumption of vacant land, the No Project Alternative has a greater risk of locating RTP projects and/or development in flood prone areas. Overall, it is anticipated that the Plan would result in fewer impacts to water resources because of a compact growth pattern that would result in less impervious surfaces and less demand for water.

Cumulatively, both the Plan and the No Project Alternative would impact water quality, groundwater recharge, flood hazards, and water supply. The No Project Alternative would accommodate the same increase in population as projected for the Plan but in a more dispersed pattern. To reduce land consumption, the Plan includes land use measures that encourage development targeted in HQTAs. These measures are largely absent in the No Project alternative. As discussed above, the large lot development associated with the No Project Alternative would result in greater demands on water supply. This increase in water consumption would pull additional water from imported sources, thereby limiting water available for other parts of the State. Therefore, the No Project Alternative would result in greater cumulative impacts to water supply than the Plan.

Additional impacts described above include water quality effects. These impacts would be greater under the No Project Alternative as increased impervious surface (which contributes to water quality impacts) would be greater under the No Project Alternative. This would result in greater impacts to water quality and could affect water in areas outside the SCAG region. Therefore, cumulative water quality impacts would be greater under the No Project Alternative than the Plan alternative.

ANALYSIS OF ALTERNATIVE 2 – MODIFIED 2008 RTP ALTERNATIVE

Aesthetics

Under the Modified 2008 RTP Alternative, fewer roadways would be constructed resulting in fewer opportunities for impacts to scenic highways and vistas. However, the Modified 2008 RTP Alternative would not include the urban form strategies included in the SCS, intended to focus more growth in walkable, mixed-use communities and existing and planned high-quality transit areas. As shade/shadow and glare impacts typically occur in urban areas, these impacts would be reduced under the Modified 2008 RTP Alternative. Nighttime lighting impacts would be greater as more vacant land would be consumed under the 2008 Modified RTP Alternative, as lighting impacts are most pronounced in rural areas. Therefore, the Modified 2008 RTP Alternative would result in fewer impacts to scenic vistas and shade/shadow and glare but would result in greater lighting impacts than the 2012-2035 RTP/SCS.

Air Quality, including Cancer Risk and Other Health Incidences Related to VMT

Table 4-8 compares the Modified 2008 RTP Alternative criteria pollutant emissions by county to the Plan emissions. The Plan would result in fewer emissions than the Modified 2008 RTP Alternative with two exceptions. NO_X emissions would not change in Los Angeles County and summer NO_X emissions would not change in Ventura County. The Plan would improve regional emissions compared to the Modified 2008 RTP Alternative.

Tables 4-9 and **4-10** show the residential and workplace cancer risk, respectively. The maximum residential and workplace risks due to vehicle operation on all freeway segments are much higher under existing (2012) conditions than under the Modified 2008 RTP Alternative. The declines in cancer risk across all freeway segments are the result of continued decreases in per-vehicle mile fleet emissions projected to occur due to continued emission control technology improvements in new vehicles. The total regional risk would be lower under the Modified 2008 RTP Alternative than the No Project Alternative. When compared to the Plan, the Modified 2008 RTP Alternative would result in a higher risk in Imperial, Riverside, and San Bernardino Counties. In addition, it is estimated that the Modified 2008 RTP Alternative would result in 318,093 annual health incidences leading to $5,355,838,209 spent on healthcare whereas the Plan would result in 293,633 annual health incidences leading to $4,952,996,222 spent on healthcare. Therefore, the Modified 2008 RTP Alternative would result in a greater health risks.

Increasing population adjacent to transportation facilities could expose more people to increased cancer and other health risks. The dispersed nature of the Modified 2008 RTP would result in more development around freeways and therefore, risk levels would be greater than the Plan.

The Modified 2008 RTP Alternative would involve construction activity throughout the transportation system. Construction emissions would likely exceed the significance thresholds established in the CEQA Guidelines. Similar to the Plan, construction emissions would result in a significant short-term impact.

Projected long-term emissions are considered to be cumulatively significant if they are not consistent with the local air quality management plans and state implementation plans. As previously indicated, regional emissions under the Modified 2008 RTP Alternative are greater than under the Plan. The Plan conforms to the local air quality management plans, and cumulative impacts are considered less than significant. Unlike the Plan, the Modified 2008 RTP Alternative may not conform to the local air quality management plans and could have a significant cumulative impact.

TABLE 4-8: CRITERIA POLLUTANT EMISSIONS BY COUNTY – MODIFIED 2008 RTP ALTERNATIVE (2012) VS PLAN (2035)

County		Tons/Day								
		ROG Summer	ROG Annual	NO_x Summer	NO_x Annual	NO_x Winter	CO Winter	PM10 Annual	PM2.5 Annual	SO_x Annual
Los Angeles /a/	Modified 2008 RTP	43	41	70	71	75	315	13	9	1
	Plan	42	41	70	71	75	299	12	8	1
	Difference	(1)	(1)	0	0	0	(15)	(1)	(1)	0
Imperial	Modified 2008 RTP	4	3	10	9	10	25	1	1	0
	Plan	4	3	9	9	9	24	1	1	0
	Difference	0	0	0	0	0	(1)	0	0	0
Orange	Modified 2008 RTP	15	14	19	19	20	101	4	3	0
	Plan	14	14	19	19	20	96	4	3	0
	Difference	0	0	0	0	0	(5)	0	0	0
Riverside /b/	Modified 2008 RTP	15	14	36	35	37	121	5	4	1
	Plan	15	13	35	35	36	114	5	3	1
	Difference	0	0	(1)	1	(1)	(8)	0	0	0
San Bernardino /c/	Modified 2008 RTP	15	14	39	39	39	121	5	3	1
	Plan	15	13	37	37	38	114	5	3	0
	Difference	0	0	(1)	(1)	(1)	(6)	0	0	0
Ventura	Modified 2008 RTP	4	4	5	6	6	28	1	1	0
	Plan	4	4	5	6	6	27	1	1	0
	Difference	0	0	0	0	0	(1)	0	0	0

Note: 2012 modeled conditions are used to approximate 2011 conditions; in the professional opinion of SCAG modelers 2012 conditions are similar if not the same as 2011 conditions.
/a/ Los Angeles County excludes Antelope Valley
/b/ Riverside County includes the SCAB, MDAB and Coachella Valley portions
/c/ San Bernardino County includes the SCAB and MDAB portions
SOURCE: SCAG Transportation Modeling, 2011.

TABLE 4-9: MAXIMUM CANCER RISK BASED ON RESIDENTIAL EXPOSURE TO VEHICLE OPERATION BY PLANNING SCENARIO AND FREEWAY CORRIDOR – MODIFIED 2008 RTP ALTERNATIVE

Planning Scenario	Maximum Cancer Risk Over 70-Year Residential Exposure (in one million)							
	I-405 (Orange)	I-710 (Los Angeles)	I-8 (Imperial)	SR 60 (San Bernardino)	SR 91 (Riverside)	US 101 (Ventura)	SR 60 (Los Angeles)	I-15 (San Bernardino)
Existing Conditions (2012)	1,080	1,040	503	1,770	1,960	372	1,470	811
Modified 2008 RTP (2035)	442	421	401	618	674	196	476	405
Plan (2035)	462	475	399	714	668	199	536	354

SOURCE: Sierra Research, 2011.

TABLE 4-10: MAXIMUM CANCER RISK BASED ON WORKPLACE EXPOSURE TO VEHICLE OPERATION BY PLANNING SCENARIO AND FREEWAY CORRIDOR – MODIFIED 2008 RTP ALTERNATIVE

Planning Scenario	Maximum Cancer Risk Over 70-Year Residential Exposure (in one million)							
	I-405 (Orange)	I-710 (Los Angeles)	I-8 (Imperial)	SR 60 (San Bernardino)	SR 91 (Riverside)	US 101 (Ventura)	SR 60 (Los Angeles)	I-15 (San Bernardino)
Existing Conditions (2012)	163	158	76	269	297	56	223	123
Modified 2008 RTP (2035)	67	64	61	94	102	30	72	61
Plan (2035)	70	72	60	108	101	30	81	54

SOURCE: Sierra Research, 2011.

Biological Resources and Open Space

Under the Modified 2008 RTP Alternative, fewer areas would be impacted by excavation and construction activities as compared to the Plan. However, the Modified 2008 RTP Alternative would not include the urban form strategies included in the SCS, intended to focus more growth in walkable, mixed-use communities and existing and planned high-quality transit areas. Therefore, the Modified 2008 RTP Alternative would result in transportation projects and development taking place over a greater amount of land. Specifically, new transportation projects included in the Modified 2008 RTP Alternative would result in 355 square miles of new land consumption, as compared to 334 square miles under the Plan. This would result in greater vacant land consumption, including sensitive species habitat and natural lands, that would, in turn, increase the impacts to biological resources and open space, such as habitat loss and fragmentation. Therefore, the Modified 2008 RTP Alternative impacts to biological resources and open space would be greater than the impacts from the 2012-2035 RTP/SCS.

Cultural Resources

Under the Modified 2008 RTP Alternative, there would be a similar number of transportation projects but development patterns would extend over a somewhat greater area of land. The Modified 2008 RTP Alternative would not include the urban form strategies included in the SCS, intended to focus more growth in walkable, mixed-use communities and existing and planned high-quality transit areas. Therefore, the Modified 2008 RTP Alternative would result in development taking place over a greater area of land. The Modified 2008 RTP Alternative would result in 355 square miles of new land consumption, as compared to 334 square miles under the Plan. This would increase the chance to uncover a greater number of previously undisturbed resources. Therefore, the Modified 2008 RTP Alternative impacts to cultural resources would be greater than the impacts from the 2012-2035 RTP/SCS. The Modified 2008 RTP Alternative would not focus growth in urban areas to the extent of the Plan and therefore could have fewer impacts ion historic buildings.

Geology and Soils

Implementation of the 2012-2035 RTP/SCS would result in a greater number of transportation projects and would increase the amount of transportation infrastructure that would be subject to risk as a result of surface rupture, ground-shaking liquefaction, and landsliding and other risks associated with seismic events. The Modified 2008 Alternative would result in the construction of fewer new lane miles than the 2012-2035 RTP/SCS. Impacts related to geologic and seismic resources would be similar to the Plan under the Modified 2008 Alternative because the population would be the same and entire region is subject to seismic risk.

The reduced amount of RTP projects would be expected to occur under the Modified 2008 Alternative could result in a decrease in the amount of aggregate and mineral resources demand in the region. However as more land would be consumed under the Modified 2008 Alternative (355 square miles compared to 334 square miles under the Plan), more local access roads are anticipated to be needed. The more compact development pattern under the Plan could use less aggregate per capita as more compact development is more efficient. On balance it is anticipated that the Modified 2008 Alternative would result in greater impacts because dispersed development is less efficient in its use of aggregate as compared to a more compact development pattern.

Greenhouse Gas Emissions

Table 4-11 compares the Modified 2008 RTP Alternative GHG emissions by county to the Plan emissions. It is estimated (based on simplified gross estimates of construction, energy use and water use) that in 2020 the Plan would result in five million metric tons less of GHG emissions than the Modified 2008 RTP Alternative. In 2035, the Plan would result in 12 million metric tons less of GHG emissions than the Modified 2008 RTP Alternative. The Plan would improve regional GHG emissions compared to the Modified 2008 RTP Alternative.

TABLE 4-11: GREENHOUSE GAS EMISSIONS BY COUNTY - 2008 MODIFIED RTP ALTERNATIVE

Area and Source	CO_2e Emissions (Million Metric Tons per Year)			
	Modified 2008 RTP (2020)	Plan (2020)	Modified 2008 RTP (2035)	Plan (2035)
IMPERIAL COUNTY				
Construction	0.01	0.01	0.01	0.01
Transportation	1.8	1.7	2.5	2.4
Building Energy	0.53	0.41	0.58	0.39
Water-Related Energy	0.04	0.03	0.05	0.02
Subtotal	2.4	2.2	3.1	2.8
LOS ANGELES COUNTY				
Construction	0.16	0.16	0.15	0.15
Transportation	43	41	48	44
Building Energy	22	23	21	21
Water-Related Energy	2.1	2.2	1.9	1.9
Subtotal	67	66	71	67
ORANGE COUNTY				
Construction	0.04	0.04	0.04	0.04
Transportation	14	13	15	14
Building Energy	6.1	6.0	5.6	5.6
Water-Related Energy	0.63	0.64	0.57	0.59
Subtotal	21	20	21	20
RIVERSIDE COUNTY				
Construction	0.11	0.11	0.11	0.11
Transportation	15	14	20	18
Building Energy	5.5	4.8	6.3	4.9
Water-Related Energy	0.50	0.42	0.55	0.38
Subtotal	21	19	27	23
SAN BERNARDINO COUNTY				
Construction	0.07	0.07	0.07	0.07
Transportation	14	13	18	17
Building Energy	4.7	4.4	5.1	4.3
Water-Related Energy	0.43	0.38	0.44	0.34
Subtotal	19	18	24	22
VENTURA COUNTY				
Construction	0.01	0.01	0.01	0.01
Transportation	3.9	3.7	4.3	3.9
Building Energy	1.9	1.9	1.9	1.8
Water-Related Energy	0.18	0.17	0.16	0.09
Subtotal	6.0	5.8	6.4	5.8
Total Emissions	**136**	**131**	**153**	**141**
Plan (2020) Compared to Modified 2008 RTP (2020)				**(5)**
Plan (2035) Compared to Modified 2008 RTP (2035)				**(12)**

Note: The estimation of GHG emissions does not include the following sources: solid waste, aircraft, watercraft, trains, and industrial process sources. Total emissions resulting from construction, energy and water use are gross estimates based on simplified assumptions for purposes of this programmatic analysis.
SOURCE: TAHA, 2011; SCAG Transportation Modeling, 2011; Calthorpe, 2011.

AB 32 calls for GHG emissions to be reduced to 1990 levels by 2020. In the absence of reliable 1990 GHG emissions estimates, ARB recommends an equivalent metric of 15 percent below 2005 GHG emissions. Because the Scoping Plan time horizon is limited to 2020, analysis is presented for the year 2020 only, not for 2035 or 2050. As shown in **Table 4-12**, GHG emissions in 2020 are expected to be greater than the Plan and greater than the GHG emissions target set by AB 32. Because SCAG has no control over many future emissions factors (e.g., energy and water demand), SCAG made extremely conservative assumptions regarding these factors. Similar to the Plan, the Modified 2008 RTP Alternative would not achieve the AB 32 targets.

TABLE 4-12: GREENHOUSE GAS AB 32 ANALYSIS – 2008 MODIFIED RTP ALTERNATIVE	
Scenario	**CO_2e Emissions (Million Metric Tons per Year)**
Plan vs. 2005 Baseline Change in Emissions (AB 32 Target is 15% below 2005 levels by 2020)	1%
Modified 2008 RTP vs. 2005 Baseline Change in Emissions (AB 32 Target is 15% below 2005 levels by (2020)	3%
Note: The estimation of GHG emissions does not include the following sources: solid waste, waterborne navigations, trains, aviation, agricultural uses, ozone depleting substances commercially produced (e.g., hydrofluorocarbons), and industrial processes. **SOURCE**: TAHA, 2011; SCAG Transportation Modeling, 2011; Calthorpe, 2011.	

As described in the Regulatory Setting above, SB 375 requires ARB to develop regional CO_2 emission reduction targets, compared to 2005 emissions, *for cars and light trucks only* for 2020 and 2035 for each of the State's MPOs. Significantly, where SCAG has control over transportation network improvements and growth distribution as part of its Plan, it is able to meet the SB 375 target with the SCS. **Table 4-13** shows that regional per capita GHG emissions would increase under the Modified 2008 RTP Alternative. As a result, the Modified 2008 RTP Alternative would not achieve the SB 375 emissions targets (as compared to the Plan which would meet the targets).

TABLE 4-13: SB 375 ANALYSIS – 2008 MODIFIED RTP ALTERNATIVE			
County	**Baseline (2005)**	**Modified 2008 RTP 2035)**	**Plan (2035)**
Resident Population (per 1,000) /a/	17,161	21,773	21,773
CO_2 Emissions (per 1,000 Tons) /b/	204.7	243.9	222.9
Per Capita Emissions (Pounds)	23.9	22.4	20.5
Percent Difference from Plan (2035) to Baseline (2005)			(14%)
(Additional Reductions from 4D Model) /c/			(2%)
Total Reductions			(16%)
Percent Difference from Modified 2008 RTP (2035) to Baseline (2005)			(6%)
/a/ Population estimates exclude the group quarter population (e.g., dorms, prisons, long term hospitals). /b/ Emissions are from passenger vehicles and light-duty trucks. /c/ For description of 4D Model, see SCAG NHTS Model Documentation Report. **SOURCE**: SCAG Transportation Modeling, 2011.			

Hazardous Materials

The Modified 2008 RTP Alternative would have similar impacts related to the accidental release of hazardous materials as compared to the Plan. The Modified 2008 RTP Alternative would not include the urban form strategies included in the SCS which are intended to focus more growth in walkable, mixed-use communities and existing and planned HQTAs. Anticipated development under the Modified 2008 RTP Alternative would result in 355 square miles of new land consumption, as compared to 334 square miles under the Plan. The Modified 2008 RTP Alternative may not include as much redevelopment of urban infill properties as the Plan, and, therefore, may result in fewer potential impacts related to disturbance of contaminated sites as compared to the Plan. However it would disturb somewhat more undeveloped and open space uses, some of which might be farmland and may be contaminated with pesticides from past operations and thus can result in impacts when ground is disturbed.

The Modified 2008 RTP Alternative would result in similar cumulative impacts as the Plan, as this Alternative would include transportation investments that would increase mobility. It is anticipated that VMT under the Modified 2008 RTP Alternative would be 159.6 billion miles in 2035, as compared to 147.3 billion under the Plan. Increased mobility would increase the possibility of hazardous materials transport throughout the SCAG region, as well as through areas outside of the region. As the population in southern California increases through 2035, the number of trips in the SCAG region that originate, end or pass through

Santa Barbara, San Diego and Kern counties as well as other counties and states would increase, including trips involving the transportation of hazardous materials

Land Use and Agricultural Resources

The Modified 2008 RTP Alternative includes fewer transportation projects than the 2012-2035 RTP/SCS and does not include any land use strategies. It would have a lesser potential for conflicting with general plans as the only growth strategies that would occur would be local land use controls. It also would have less of an influence on the patterns of urbanization in the region. Nonetheless, urbanization with significant potential for land use incompatibility would occur. The Modified 2008 RTP Alternative would result in a more dispersed land use pattern. The Modified 2008 RTP Alternative would consume an estimated 355 square miles of open space/vacant land, while the Plan would consume only 334 square miles of open space/vacant land. Therefore, the Modified 2008 RTP Alternative would have greater impacts related to conversion of farmland and agricultural lands. The Modified 2008 RTP Alternative would likely have similar or possibly greater impact on land use incompatibility because redevelopment in existing communities would still occur and more land in general would be impacted.

The Modified 2008 RTP Alternative contains fewer transportation investments than the Plan Alternative. Consequently, there would be fewer places where businesses and homes would be displaced by transportation projects and fewer places where communities would be disrupted. Due to the dispersed pattern of the Modified 2008 RTP Alternative, the Modified 2008 RTP Alternative would occur within fewer acres of business land uses (commercial, industrial and extraction land uses) and residential land uses (rural, low, and medium to high density housing land uses) than the Plan. The impacts of transportation projects alone under the Plan would result in greater impacts as compared to the Modified 2008 RTP Alternative. Development impacts are less clear, since under the Plan development would be concentrated in urban areas. In contrast, in the Modified 2008 RTP Alternative land uses would change to a much greater extent in undeveloped areas.

The Modified 2008 RTP Alternative is expected to accommodate the same increase in total population as the Plan. However, the Plan includes land use measures that would help reduce the consumption and disturbance of agricultural lands, vacant lands, open space, and recreation lands. These policies and mitigation strategies are absent in the Modified 2008 RTP Alternative. Under the Modified 2008 RTP Alternative, up to approximately 355 square miles of vacant, open space and agricultural lands would be consumed, compared 334 square miles under the Plan. The more dispersed land use pattern of the Modified 2008 RTP Alternative would consume more vacant land, but also could impact areas outside the region through setting a precedent for the conversion of non-urban lands. This would happen as development spreads out along existing freeways or similar methods of expansion. Under the Modified 2008 RTP Alternative land use changes could affect jurisdictions outside the SCAG region, by setting a precedent for and/or inducing consumption of agricultural lands; such impacts would be cumulatively considerable. The Plan would decrease congestion potentially making it easier for people to live and work outside the region, thereby inducing land uses changes outside the region, these impacts also could be cumulatively considerable.

Noise

The transportation improvements in the Modified 2008 RTP Alternative are similar to those in the Plan. Construction noise and vibration related to activities such as grading, power tools, and earth moving would therefore be generally the same as for the Plan. The Plan and the 2008 Modified RTP Alternative would have similar construction related impacts.

The impact of noise on areas directly located next to transportation facilities would be similar for the Modified 2008 RTP Alternative and the Plan. The projects included in both alternatives would be similar resulting in similar impacts occurring near transportation facilities, both would also likely result in a comparable number of sensitive receptors that would be impacted.

Cumulative noise impacts for the Modified 2008 RTP Alternative would also be similar to those from implementation of the Plan. Construction, ambient, aviation and port noise would be the same between the two alternatives. The Plan would have similar noise impacts to the 2008 Modified RTP Alternative.

Population, Housing and Employment

The Modified 2008 RTP Alternative has the same population, household, and employment growth as the Plan. The impact of the induced growth from the Modified 2008 RTP Alternative would be similar to the Plan, although there would be differences in the distributions. For example, the 2008 Modified RTP would result in an increase in population, households, and employment in Orange County. Given that the population, household, and employment growth would be the same at the regional level, the Plan impacts would be the same as those associated with the 2008 Modified RTP.

The Modified 2008 RTP Alternative's growth strategies would not focus the future population in urban areas to the same extent as the Plan's 355 acres (227,200 acres) of previously undisturbed land (as compared to 334 square miles – 213,800 acres -- disturbed under the Plan); the Plan's growth strategies would result in more compact development around HQTAs. The Plan would be more likely to result in displacing more businesses or homes as more than half of the anticipated development would occur in already urbanized areas. In many of these urbanized areas vacant land is scarce, resulting in a greater potential for projects to displace existing uses.

Public Services and Utilities

Fire and Police Protection and Emergency Services

The Modified 2008 RTP Alternative would result in similar transportation-related public services impacts as compared to the Plan. The No Project Alternative and the Plan alternatives include the same number of population, housing and jobs that would require police, fire and emergency facilities. However, under the 2008 Modified RTP Alternative, development would be more dispersed resulting in slightly greater impacts as response times may be increased as police, fire and emergency personnel have to travel farther distances.

The Modified 2008 RTP would result in greater impacts related to wildfire threats as compared to the Plan, because without the urban form strategies included in the SCS, there would be less focus on urban centers and a greater number of homes and communities could locate in rural areas with a greater risk of wildfire.

Educational Facilities

The Modified 2008 RTP Alternative would result in similar educational facilities impacts as the Plan. Without the land use strategies of the Plan, the Modified 2008 RTP may not result in the same level of urbanization as the Plan; however, the population in the SCAG region is anticipated to be the same under both Alternatives. Therefore, both the Modified 2008 RTP Alternative and the Plan would result in the need for additional educational facilities to accommodate a growing population.

Recreational Facilities

The Modified 2008 RTP Alternative would result in greater impacts to recreational facilities as compared to the Plan. Without the urban form strategies included in the Plan, the Modified 2008 RTP would result in more development outside of urban areas, thereby increasing the potential for impacts to recreation lands or open space. The Modified 2008 RTP would consume 355 square miles of new land as compared to 334 square miles under the Plan. The 2035 population is anticipated to be the same under the Modified 2008 RTP Alternative as under the Plan, resulting in a similar parks-to-people ratio.

Solid Waste and Transfer Facilities

The Modified 2008 RTP Alternative would result in similar impacts to solid waste disposal and transfer facilities as the Plan. This Alternative would include similar transportation improvements projects as the Plan, resulting in the need for solid waste disposal and transfer facilities during construction. The 2035 population is anticipated to be the same under the Modified 2008 RTP Alternative as under the Plan, thereby resulting in similar need for solid waste disposal and transfer facilities to accommodate the population. Increased greenwaste could occur under the Modified 2008 RTP because of the increased consumption of land and lower density development possibly leading to more landscaping.

Energy

Because the Modified 2008 RTP Alternative contains fewer transportation projects than the Plan, the potential to disrupt or sever underground utility lines would be less in the No Project Alternative than in the Plan, although the more disperse development Plan would increase the opportunity to sever lines outside urban areas. The Modified 2008 RTP Alternative would result in greater impacts to energy as compared to the Plan. Because the Modified 2008 RTP does not include the urban form strategies that are included in the Plan, development would occur in response to local general plans. It can be anticipated that this Alternative would include less mixed-use/walkable communities and urban infill development areas, which tend to accommodate more energy efficient housing types and rely less heavily on motorized forms of transportation. VMT under the Modified 2008 RTP Alternative is expected to be approximately 549 million miles per day, as compared to 517 million miles under the Plan. The total building energy usage under the Modified 2008 RTP Alterative is expected to be approximately the same as under the Plan (589 trillion Btu), however, transportation and development under this Alternative would consume more energy than the Plan because of greater VMT and a more dispersed (less efficient) growth pattern.

Transportation, Traffic and Security

The Modified 2008 RTP Alternative would result in greater than or equal transportation impacts as compared to the Plan. The Modified 2008 RTP Alternative would generally be expected to result in more miles traveled and more delay. In 2035 the Modified 2008 RTP Alternative would result in 549.1 million daily VMT, more than the Plan's 517 million daily VMT. Daily hours of delay under the Modified 2008 RTP Alternative would be 4.4 million vehicle-hours for all vehicles and 0.246 million vehicle-hours for heavy-duty trucks. Comparatively, the Plan would produce 3.1-million vehicle-hours of delay for all vehicles and 0.158 million vehicle-hours of delay for heavy-duty trucks.

The effects of growth and other external factors are included in the Regional Travel Demand Model that produces the results reported above. Because these external factors are modeled, the cumulative effects of regional growth are captured in the VMT, VHD, and heavy-duty truck VHD data reported for the Modified 2008 RTP Alternative above. The Modified 2008 RTP Alternative would have less cumulative impacts than the Plan.

Water Resources

Under the Modified 2008 RTP Alternative, fewer areas would be impacted by excavation and construction activities related to transportation projects as compared to the Plan. However, the Modified 2008 RTP Alternative would not include the urban form strategies included in the SCS, intended to focus more growth in walkable, mixed-use communities and existing and planned high-quality transit areas. Therefore, the Modified 2008 RTP Alternative would result in development patterns consuming a greater amount of land. Specifically, anticipated development under the Modified 2008 RTP Alternative would result in 355 square miles of new land consumption, as compared to 334 square miles under the Plan thereby increasing the amount of impervious surfaces and increasing impacts to water resources. Therefore, the Modified 2008 RTP Alternative impacts to water resources would be greater than the impacts from the 2012-2035 RTP/SCS.

ANALYSIS OF ALTERNATIVE 3 – ENVISION 2 ALTERNATIVE

Aesthetics

Under the Envision 2 Alternative more aggressive growth strategies would be applied to the region. This would potentially result in greater impacts related to light and glare, shade and shadow and visual character of neighborhoods as more intense development occurs within urban centers. Taller buildings could be incongruous with existing surroundings and could overwhelm historic buildings and/or existing neighborhoods. Further, glare impacts and shade and shadow impacts could be increased due to increase density. However, as more development is focused in urban areas, fewer nighttime lighting impacts would occur in undeveloped areas. Lastly, impacts related to scenic highways and vistas would generally be the same as both alternatives include similar transportation networks.

Air Quality, including Cancer Risk and Other Health Incidences Related to VMT

Table 4-14 compares the Envision 2 Alternative criteria pollutant emissions by county to the Plan emissions. These emission changes result from the development pattern that focuses residential and employment growth in High Quality Transportation Areas. Compared to the Plan, the Envision 2 Alternative could slightly increase regional emissions in Los Angeles County although overall emissions would decrease.

Tables 4-15 and **4-16** show the residential and workplace cancer risk, respectively. The maximum residential and workplace risks due to vehicle operation on all freeway segments are much higher under existing conditions than under the Plan or the Envision 2 Alternative. The declines in cancer risk across all freeway segments are the result of continued decreases in per-vehicle mile fleet emissions projected to occur due to continued emission control technology improvements in new vehicles.

As compared to the Plan, Envision 2 would result in higher risk than the Plan for 2 of the 8 corridors segments modeled: I-15 in San Bernardino and I-405 in Orange. Due to the increased density in urban areas heavy truck volumes on these segments would be higher under Envision 2. (On the I-405, both heavy truck and total vehicle volumes would be higher). In addition, it is estimated that the Envision 2 Alternative would result in 266,340 annual health incidences leading to $4,329,661,096 spent on healthcare, whereas the Plan would result in 293,633 annual health incidences leading to $4,952,996,222 spent on healthcare. Therefore, the Envision 2 Alternative would result in a fewer health risks.

Increasing population adjacent to transportation facilities could expose more people to increased cancer and other health risks. Even though cancer and other health risks adjacent to freeways and railroads would decrease considerably under the Envision 2 Alternative, risk levels would remain above average for the region and would be similar to the Plan. Impacts to increasing population adjacent to transportation facilities would similar to the Plan as both include similar transportation networks

The Envision 2 Alternative would involve construction activity throughout the transportation system and in HQTAs across the region (as well as some construction outside HQTAs). Construction emissions of many projects would likely exceed the significance thresholds established in the CEQA Guidelines. Similar to the Plan, construction emissions would result in significant short-term impacts for individual projects. Projected long-term mobile source emissions are considered to be cumulatively significant if they are not consistent with the local air quality management plans and state implementation plans. Some regional emissions under the Envision 2 Alternative are greater than under the Plan (**Table 4-14**). The Plan conforms to the local air quality management plans, and cumulative impacts are considered less than significant. The Envision 2 Alternative would be expected to meet conformity requirements.

TABLE 4-14: CRITERIA POLLUTANT EMISSIONS BY COUNTY – ENVISION 2 ALTERNATIVE (2012) VS PLAN (2035) (TONS PER DAY)

County		ROG Summer	ROG Annual	NO_x Summer	NO_x Annual	NO_x Winter	CO Winter	PM10 Annual	PM2.5 Annual	SO_x Annual
Los Angeles /a/	Envision 2	43	41	73	74	78	315	13	9	1
	Plan	42	41	70	71	75	299	12	8	1
	Difference	(1)	1	(2)	(3)	(3)	(15)	(1)	(1)	0
Imperial	Envision 2	3	3	9	8	9	21	1	0	0
	Plan	4	3	9	9	9	24	1	1	0
	Difference	0	0	1	1	1	3	0	0	0
Orange	Envision 2	15	14	19	19	20	98	4	3	0
	Plan	14	14	19	19	20	96	4	3	0
	Difference	0	0	0	0	0	(2)	0	0	0
Riverside /b/	Envision 2	14	13	32	32	33	95	4	3	0
	Plan	15	13	35	35	36	114	5	3	1
	Difference	1	1	3	3	3	19	1	1	0
San Bernardino /c/	Envision 2	14	13	36	36	36	104	4	3	0
	Plan	15	13	37	37	38	114	5	3	0
	Difference	0	0	1	2	2	10	1	0	0
Ventura	Envision 2	4	4	5	6	6	26	1	1	0
	Plan	4	4	5	6	6	27	1	1	0
	Difference	0	0	0	0	0	1	0	0	0

Note: 2012 modeled conditions are used to approximate 2011 conditions; in the professional opinion of SCAG modelers 2012 conditions are similar if not the same as 2011 conditions.
/a/ Los Angeles County excludes Antelope Valley
/b/ Riverside County includes the SCAB, MDAB and Coachella Valley portions
/c/ San Bernardino County includes the SCAB and MDAB portions
SOURCE: SCAG Transportation Modeling, 2011.

TABLE 4-15: MAXIMUM CANCER RISK BASED ON RESIDENTIAL EXPOSURE TO VEHICLE OPERATION BY PLANNING SCENARIO AND FREEWAY CORRIDOR – ENVISION 2 ALTERNATIVE

Planning Scenario	Maximum Cancer Risk Over 70-Year Residential Exposure (in one million)							
	I-405 (Orange)	I-710 (Los Angeles)	I-8 (Imperial)	SR 60 (San Bernardino)	SR 91 (Riverside)	US 101 (Ventura)	SR 60 (Los Angeles)	I-15 (San Bernardino)
Existing Conditions (2012)	1,080	1,040	503	1,770	1,960	372	1,470	811
Envision 2 (2035)	442	421	401	618	674	196	476	405
Plan (2035)	497	441	369	683	619	192	535	388

SOURCE: Sierra Research, 2011.

TABLE 4-16: MAXIMUM CANCER RISK BASED ON WORKPLACE EXPOSURE TO VEHICLE OPERATION BY PLANNING SCENARIO AND FREEWAY CORRIDOR – ENVISION 2 ALTERNATIVE

Planning Scenario	Maximum Cancer Risk Over 70-Year Residential Exposure (in one million)							
	I-405 (Orange)	I-710 (Los Angeles)	I-8 (Imperial)	SR 60 (San Bernardino)	SR 91 (Riverside)	US 101 (Ventura)	SR 60 (Los Angeles)	I-15 (San Bernardino)
Existing Conditions (2012)	163	158	76	269	297	56	223	123
Envision 2 (2035)	67	64	61	94	102	30	72	61
Plan (2035)	75	67	56	104	94	29	81	59

SOURCE: Sierra Research, 2011.

Biological Resources and Open Space

Under the Envision 2 Alternative, fewer undeveloped areas would be impacted by excavation and construction activities as compared to the Plan. The Envision 2 Alternative focuses on TOD and further expansion of non-motorized transportation. Under the Envision 2 Alternative, transportation improvement projects would result in 75 square miles of new land consumption as compared to 334 square miles under the Plan, thereby reducing the impacts to biological resources and open space as compared to the 2012-2035 RTP/SCS. Given that the Envision 2 Alternative would redevelop moore existing areas than the Plan, the Envision 2 Alternative would result in greater impacts to historic resources.

Cultural Resources

Under the Envision 2 Alternative, fewer undeveloped areas would be impacted by excavation and construction activities related to transportation projects as compared to the Plan. The Envision 2 Alternative focuses on TOD and further expansion of non-motorized transportation. Under the Envision 2 Alternative, anticipated development would result in 75 square miles (48,000 acres) of new land consumption as compared to 334 square miles (213,800 acres) under the Plan, thereby exposing fewer previously undisturbed cultural resources. As with the Plan, increased focus on redevelopment of existing communities could result in increased impacts to historic buildings.

Geology and Soils

The Envision 2 transportation network is similar to the Plan network with minor changes to goods movement and transit projects. Construction and excavation impacts would therefore be generally the same as for the Plan. The Plan and the Envision 2 Alternative would have similar construction related impacts.

The Envision 2 Alternative focuses residential and employment growth in HQTAs. Development is anticipated to be more compact (more multi-family as compared to single-family housing). Some HQTAs are located near known faults and other geologic hazards which could increase the number of people and structures exposed to potential surface rupture, ground-shaking liquefaction, and landsliding due to seismic events. However, both the Envision 2 Alternative and the Plan would likely result in geological and mineral resources impacts as the transportation networks would be very similar, with some expansion to the transit networks under the Envision 2 Alternative.

Cumulative geologic and mineral resources impacts for the Envision 2 Alternative would also be similar to those from implementation of the Plan. Geological and mineral resources impacts would be similar between the two alternatives. The Plan would have similar cumulative geological and mineral resources impacts to the Envision 2 Alternative.

Greenhouse Gas Emissions

Table 4-17 compares the Envision 2 Alternative GHG emissions by county to the Plan emissions. It is estimated (based on simplified gross estimates of construction, energy use and water use) that in 2035, the Plan would result in 3 million metric tons more of GHG emissions than the Envision 2 Alternative. The Envision 2 Alternative would improve regional GHG emissions compared to the Plan.

TABLE 4-17: GREENHOUSE GAS EMISSIONS BY COUNTY – ENVISION 2 ALTERNATIVE

Area and Source	CO_2e Emissions (Million Metric Tons per Year) Envision 2 (2035)	Plan (2035)
IMPERIAL COUNTY		
Construction	0.01	0.01
Transportation	2.0	2.4
Building Energy	0.39	0.39
Water-Related Energy	0.02	0.02
Subtotal	2.4	2.8
LOS ANGELES COUNTY		
Construction	0.15	0.15
Transportation	47	44
Building Energy	21	21
Water-Related Energy	1.9	1.9
Subtotal	70	67
ORANGE COUNTY		
Construction	0.04	0.04
Transportation	14	14
Building Energy	5.6	5.6
Water-Related Energy	0.59	0.59
Subtotal	20	20
RIVERSIDE COUNTY		
Construction	0.11	0.11
Transportation	14	18
Building Energy	4.9	4.9
Water-Related Energy	0.38	0.38
Subtotal	19	23
SAN BERNARDINO COUNTY		
Construction	0.07	0.07
Transportation	15	17
Building Energy	4.3	4.3
Water-Related Energy	0.34	0.34
Subtotal	20	22
Ventura County		
Construction	0.01	0.01
Transportation	4	3.9
Building Energy	1.8	1.8
Water-Related Energy	0.09	0.09
Subtotal	5.9	5.8
Total Emissions	**138**	**141**
	Envision 2 Compared to Plan (2035)	**(3)**

Note: The estimation of GHG emissions does not include the following sources: solid waste, aircraft, watercraft, trains, and industrial process sources. Total emissions resulting from construction, energy and water use are gross estimates based on simplified assumptions for purposes of this programmatic analysis.
SOURCE: TAHA, 2011; SCAG Transportation Modeling, 2011; Calthorpe, 2011.

AB 32 calls for GHG emissions to be reduced to 1990 levels by 2020. In the absence of reliable 1990 GHG emissions estimates, ARB recommends an equivalent metric of 15 percent below 2005 GHG emissions. Under the Plan, GHG emissions in 2020 are expected to be greater than the GHG emissions target set by AB 32. Because SCAG has no control over many future emissions factors (e.g., energy and water demand), SCAG made extremely conservative assumptions regarding these factors. An estimate of 2020 emissions was not completed for the Envision 2 Alternative because the increased land use effects included in Envision 2 don't occur until after 2020. As demonstrated above, the Envision 2 Alternative would generate less GHG emissions than the Plan. However, similar to the Plan, the Envision 2 Alternative would not achieve the AB 32 targets.

As described in the Regulatory Setting above, SB 375 requires ARB to develop regional CO_2 emission reduction targets, compared to 2005 emissions, *for cars and light trucks only* for 2020 and 2035 for each of the State's MPOs. Significantly, where SCAG has control over transportation network improvements and growth distribution as part of its Plan, it is able to meet the SB 375 target with the SCS. **Table 4-18** shows that regional per capita GHG emissions would decrease under the Envision 2 Alternative. As a result, the Envision 2 Alternative would achieve the SB 375 emissions targets (the Plan would also meet the targets).

TABLE 4-18: SB 375 ANALYSIS – ENVISION 2 ALTERNATIVE

County	Baseline (2005)	Envision 2 (2035)	Plan (2035)
Resident Population (per 1,000) /a/	17,161	21,773	21,773
CO_2 Emissions (per 1,000 Tons) /b/	204.7	217.3	222.88
Per Capita Emissions (Pounds)	23.9	20.0	20.47
Percent Difference from Plan (2035) to Baseline (2005)			(14%)
(Additional Reductions from 4D Model) /c/			(2%)
Total Reductions			(16%)
Percent Difference from Envision 2 (2035) to Baseline (2005) No 4D analysis performed			(16%)

/a/ Population estimates exclude the group quarter population (e.g., dorms, prisons, long term hospitals).
/b/ Emissions are from passenger vehicles and light-duty trucks.
/c/ For description of 4D Model, see SCAG NHTS Model Documentation Report.
SOURCE: SCAG Transportation Modeling, 2011.

Hazardous Materials

The Envision 2 Alternative would result in similar impacts related to the accidental release of hazardous materials as compared to the Plan. Envision 2 would include increased transportation projects. The Envision 2 Alternative focuses on TOD and further expansion of non-motorized transportation. Under the Envision 2 only 75 square miles of land would be consumed (as compared to 334 square miles under the Plan). The Envision 2 Alternative could result in greater impacts related to disturbance of contaminated sites as compared with the Plan because of the increased focus on urban redevelopment. The land use patterns associated with the Envision 2 Alternative would maximize urban centers and focus on urban infill. This would increase the potential for disturbance of contaminated sites, as there is a greater likelihood for urban redevelopment sites to be previously exposed to hazardous materials.

Land Use and Agricultural Resources

Current land use practices would have to be changed to accommodate the Envision 2 Alternative because the Envision 2 Alternative focuses considerable growth onto the existing urban area around transit station and existing activity centers. The Envision 2 Alternative would minimize the further use of land for single-family development. To achieve the densities of the Envision 2 Alternative, there would be a greater chance of conflicting with general plans in the Envision 2 Alternative than in the Plan. Because of this, the Envision 2 Alternative would have greater land use impacts than the Plan.

The Envision 2 Alternative would focus development in urban areas and existing communities and would have a greater emphasis on infill development. As a result, the Envision 2 Alternative could result in increased division of existing communities as a result of aggressive redevelopment.

Due to the compact land use development of the Envision 2 Alternative fewer agricultural resources would be impacted from transportation projects. As such, the Envision 2 Alternative would have fewer agricultural resources impacts than the Plan.

Noise

The transportation improvements in the Envision 2 Alternative are similar to those in the Plan. The Envision 2 transportation network is similar to the Plan network with changes to goods movement and transit projects. Construction noise and vibration related to activities such as grading, power tools, and earth moving would therefore be generally the same as for the Plan. The Plan and the Envision 2 Alternative would have similar construction related impacts.

Regarding transportation noise, the Envision 2 Alternative focuses residential and employment growth in High Quality Transportation Areas. Development is anticipated to be more compact (more multi-family as compared to single-family housing), therefore result in more intense areas of development and higher noise levels than under the Plan. However, both the Envision 2 Alternative and the Plan would likely result in a comparable number of sensitive receptors being impacted by transportation noise.

Cumulative noise impacts for the Envision 2 Alternative would also be similar to those from implementation of the Plan. Construction, ambient, aviation and port noise would be the same between the two alternatives. The Plan would have similar cumulative noise impacts to the Envision 2 Alternative.

Population, Housing and Employment

The Envision 2 Alternative would have the same number of households, employment and population as the Plan. The impact of the induced population growth would be similar to the Plan, as both accommodate the same population increase. The Envision 2 Alternative would focus development in urban areas and existing communities and would have a greater emphasis on infill development. As a result, the Envision 2 Alternative could result in an increase in the number of homes or businesses that are displaced as a result of aggressive redevelopment.

Public Services and Utilities

Fire and Police Protection and Emergency Services

The Envision 2 Alternative would include the same number of population, housing and jobs that would require police, fire and emergency personnel; however more of these people would be located in urban areas. In general urban areas are well served by police, fire and emergency services and as personnel would travel shorter distances to calls response times would not be substantially affects. Further, fewer emergency service personnel would be needed to serve previously inaccessible areas of the SCAG region.

The Envision 2 Alternative would result in fewer impacts related to wildfire threats as compared to the Plan, because there would be greater focus on urban centers and fewer homes and communities would locate in rural areas with a greater risk of wildfire.

Educational Facilities

The Envision 2 Alternative would have similar impacts to educational facilities as the Plan The 2035 population is expected to be similar under the Envision 2 Alternative than under the Plan; however, the Envision 2 Alternative includes more aggressive population densities than the Plan and could result in the need for additional school facilities in the areas targeted for increased population densities, such as TOD areas, HQTAs and urban infill areas.

Recreational Facilities

The Envision 2 Alternative would have fewer impacts related to recreational facilities as compared to the Plan. The Envision 2 Alternative focuses on increased densities, especially in HQTAs, and limits the development of single-family housing that would be built in the region. The Envision 2 Alternative would

result in approximately 75 square miles of new land consumption, as compared with 334 square miles under the Plan, thereby decreasing the potential to disturb existing recreational facilities. However, existing urban parks would be more severely impacted under the Envision 2 alternative.

Solid Waste Disposal and Transfer Facilities

The Envision 2 Alternative would result in fewer impacts related to solid waste disposal and transfer facilities than the Plan. The Envision 2 transportation network would require a similar amount of solid waste disposal and transfer facilities during project construction. However, the growth scenario associated with Envision 2 maximizes urban centers, TODs and HQTAs; it also includes a more progressive jobs/housing distribution optimized for TOD and infill.

Energy

Because the Envision 2 Alternative would result in greater development in urban areas, the potential to disrupt or sever underground utility lines would be greater in urban areas than the Plan. The Envision 2 Alternative would result in fewer impacts related to energy than the Plan. It includes far more aggressive densities than the Plan, especially around HQTAs, increases mobility, reduces emissions, and limits the development of single-family housing that would be built in the region. More progressive jobs and housing distribution would result in more energy efficient building types, and mixed-use/walkable communities would reduce reliance on automobiles for transportation. The land use strategies under the Envision 2 Alternative would result in fewer daily VMT. By 2035, under the Envision 2 Alternative, daily VMT would be approximately 498 million miles per day, as compared to 517 million miles under the Plan. In addition, total building energy usage under the Envision 2 Alternative would be approximately 577 trillion Btu by 2035, as compared to 589 trillion Btu under the Plan.

Transportation, Traffic and Security

The Envision 2 Alternative would result in less transportation impacts than the Plan. The Envision 2 Alternative would result in 498.3 million daily VMT, less than the Plan's 517.0 million daily VMT and the VMT in the base year, making it a beneficial impact. Daily hours of delay under the Envision 2 Alternative would be 3.4 million vehicle-hours for all vehicles and 0.159 million vehicle-hours for heavy-duty trucks. Comparatively, the Plan would produce 3.1 million vehicle-hours of delay for all vehicles and 0.158 million vehicle-hours of delay for heavy-duty trucks.

The effects of growth and other external factors are included in the Regional Travel Demand Model that produces the results reported above. Because these external factors are modeled, the cumulative effects of regional growth are captured in the VMT, VHD, and heavy-duty truck VHD data reported for the Envision 2 Alternative above. The Envision 2 Alternative would have less cumulative impacts than the Plan.

Water Resources

Under the Envision 2 Alternative, fewer undeveloped areas would be impacted by excavation and construction activities related to transportation projects as compared to the Plan. The Envision 2 Alternative focuses on Transportation Oriented Development and further expansion of non-motorized transportation. Under the Envision 2 Alternative, anticipated development would result in 75 square miles (48,000 acres) of new land consumption as compared to 334 square miles (213,800 acres) under the plan, thereby reducing the amount of impervious surfaces and decreasing impacts to water resources as compared to the 2012-2035 RTP/SCS.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Section 15126.6 of the State CEQA Guidelines requires that an "environmentally superior" alternative be selected among the alternatives that are evaluated in the PEIR. In general, the environmentally superior alternative is the alternative that would be expected to generate the fewest adverse impacts. If the No Project alternative is identified as environmentally superior, then another environmentally superior alternative shall be identified among the other alternatives.

A summary of the alternatives' impacts relative to the proposed project are shown **Table 4-19**.

TABLE 4-19: SUMMARY OF BETTER/WORSE IMPACTS BETWEEN ALL ALTERNATIVES AND THE PROPOSED PROJECT

Alternative	Better than Proposed Project	Worse than Proposed Project
Alternative 1 No Project Alternative	Noise	Aesthetics
		Air Quality
		Biological Resources & Open Spaces
		Cultural Resources
		Geology and Soils
		Greenhouse Gas Emissions
		Land Use & Agricultural Resources
		Public Services & Utilities
		Transportation, Traffic & Security
		Water Resources
Alternative 2 Modified 2008 RTP Alternative	Aesthetics	Air Quality
	Land Use and Agricultural Resources	Biological Resources & Open Spaces
		Cultural Resources
		Greenhouse Gas Emissions
		Hazardous Materials
		Land Use & Agricultural Resources
		Public Services & Utilities
		Transportation, Traffic & Security
		Water Resources
Alternative 3 Envision 2 Alternative	Air Quality	Health risk along some corridors could be greater.
	Aesthetics	
	Biological Resources & Open Spaces	
	Cultural Resources	
	Greenhouse Gas Emissions	
	Hazardous Materials	
	Land Use & Agricultural Resources	
	Population Housing & Employment	
	Public Services & Utilities	Existing Urban parks would be impacted more
	Transportation, Traffic & Security	
	Water Resources	

SOURCE: TAHA, 2011.

Of the three alternatives, the Envision 2 Alternative would be considered the environmentally superior alternative because it does not allow further use of land for single-family development. The Envision 2 Alternative concentrates development in existing urban centers around transit stations and activity centers, and therefore, has less impact on rural and undeveloped areas. The Envision 2 Alternative also has less severe impacts than the other Alternatives.

5.0 LONG TERM EFFECTS

Section 15126 of the CEQA Guidelines requires that all phases of a project must be considered when evaluating its impact on the environment, including planning, acquisition, development and operation. As part of this analysis, the EIR must also identify (1) significant environmental effects of the proposed project, (2) significant environmental effects that cannot be avoided if the proposed project is implemented, (3) significant irreversible environmental changes that would result from implementation of the proposed project, and (4) growth-inducing impacts of the proposed project. This chapter addresses all four of these impact categories.

5.1 SIGNIFICANT ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED IF THE PROPOSED PROJECT IS IMPLEMENTED

Table ES-1 Summary of Impacts and Mitigation Measures in the Executive Summary Chapter of this PEIR, and Sections 3.1 through 3.13 of this PEIR provide a comprehensive identification of the proposed project's environmental effects, including the level of significance both before and after mitigation. Many of the impacts that are determined to be significant and unavoidable could be mitigated to less than significant at the project level. However, this PEIR is at the programmatic level project information and detailed plans are not available. Therefore, without the ability to evaluate each project that could occur as a result of the Plan, these impacts were determined to be significant and unavoidable.

Section 15126.2(b) of the CEQA Guidelines requires that an EIR describe any significant impacts that cannot be avoided, even with the implementation of feasible mitigation measures. Implementation of the proposed project would result in the following unavoidable significant and project-related and/or cumulative impacts:

- Aesthetics – Implementation of the 2012-2035 RTP/SCS would obstruct views of or alter the appearance of scenic resources or vistas along designated scenic highways and vista points. In addition, construction and implementation of the projects associated with the Plan would create significant contrasts with the overall visual character of the landscape, as well as light and glare and shade and shadow effects. The effects of each of these impacts would also result in cumulative impacts outside the region.

- Air Quality – Construction in the region that would occur with implementation of the 2012-2035 RTP/SCS would exceed construction emission thresholds for NOx, CO, PM10, PM2.5, SO_2 and ROG. The Plan would increase regional operational emissions of PM10 in Imperial, Orange, and Riverside Counties.

- Biological Resources and Open Space – Implementation of the 2012-2035 RTP/SCS would displace natural vegetation, some of which is used as habitat for sensitive species in the SCAG region. Projects included in the Plan would contribute to habitat fragmentation of existing habitat, while forming barriers to animal migration or foraging routes. Construction and operation of projects and development anticipated to occur under the Plan would increase near-road disturbances such as litter, trampling, light pollution, and road noise, and would result in damage to previously inaccessible and undisturbed natural areas, or direct fatalities to wildlife. The Plan could result in potentially displacing or disturbing riparian or wetland habitat, prime farmland or grazing lands, or existing open space and recreation lands. In addition, siltation of streams and other water resources may result from construction activities in proximity to erodible soils. The Plan would contribute to a cumulatively considerable loss of biological resources and open space (consumption of 334 square miles of previously undisturbed land).

- Cultural Resources – Implementation of the 2012-2035 RTP/SCS could disturb or cause a substantial adverse change in the significance of a historical, archaeological, paleontological resource or human remains. The Plan would contribute to a cumulatively considerable loss of cultural resources.

- Geology, Soils and Mineral Resources - Implementation of the 2012-2035 RTP/SCS would expose people or structures to seismic hazards such as surface rupture, ground shaking, liquefaction, landslides, seismically induced ground-shaking or seiches or tsunami waves. In addition, projects included in the Plan could be located on expansive or unstable soils, resulting in potential on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. Earthwork associated with construction of Plan projects and development could result in substantial soil erosion and/or loss of topsoil. The Plan would also result in a significant loss of aggregate resources in the region. The Plan would also contribute to a cumulatively considerable loss of these resources.

- Greenhouse Gas Emissions – Implementation of the 2012-2035 RTP/SCS would increase greenhouse gas (GHG) emissions by 11 million metric tons as compared to existing conditions. Total GHG emissions from the Plan (including GHG emissions from emissions factors outside of SCAG's control (e.g., energy, water, etc.) could be greater than the GHG emissions target set by AB 32, which states that 2020 emissions must equal 1990 levels, or be 15 percent below 2005 levels. In other words, the Plan could not by itself meet the AB 32 reduction targets. However, implementation of the 2012-2035 RTP/SCS would meet the GHG emissions reduction targets set by ARB pursuant to SB 375.

- Hazardous Materials - Implementation of the 2012-2035 RTP/SCS would increase the risk of a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Projects included in the Plan may increase the risk of emitting hazardous materials within one-quarter mile of a school. In addition, the increased mobility associated with the Plan may significantly increase the risk associated with hazardous materials transport to areas outside of the SCAG region.

- Land Use and Agricultural Resources – Implementation of the projects and land use strategies in the 2012-2035 RTP/SCS would result in inconsistencies with currently applicable adopted local land use plans and policies. Projects associated with the Plan have the potential to disrupt or divide established communities, and may result in a substantial disturbance/loss of prime farmlands and/or grazing lands.

- Noise – Implementation of the 2012-2035 RTP would expose noise- and vibration-sensitive land uses to noise and vibration in excess of normally acceptable levels and/or experience substantial increases in noise and vibration as a result of new or expanded transportation facilities. Such facilities may increase ambient noise levels in urban areas of the region to exceed normally acceptable levels.

- Population, Housing, and Employment - Implementation of the 2012-2035 RTP/SCS would facilitate substantial population growth to some areas of the region, and may require the acquisition of rights-of-way that could displace existing homes and businesses. The Plan would contribute to a cumulatively considerable effect related to population and housing.

- Public Services and Utilities - Implementation of the 2012-2035 RTP/SCS would result in increased need for police, fire, and emergency personnel, and increase the demand for school facilities within the SCAG region. The Plan would result in loss or disturbance to existing open space and recreation lands. Anticipated development would result in the use of electricity, natural gas, gasoline, diesel, and other non-renewable energy types in the construction and expansion of transportation facilities. The Plan would contribute to a cumulatively considerable demand for public services and utilities.

- Transportation, Traffic, and Security - Implementation of projects included in the 2012-2035 RTP/SCS would increase total daily Vehicle Miles of Travel (VMT) in 2035 compared to current daily VMT and

would create substantially greater average daily VHD for heavy-duty truck trips in 2035 compared to the current condition.

- Water Resources - Implementation of the 2012-2035 RTP/SCS would degrade local surface water quality due to increased roadway runoff from construction of transportation projects. Increased impervious surfaces would reduce groundwater infiltration. The Plan would influence the pattern of urbanization in the SCAG region, and would contribute to the conversion of undeveloped land to urban areas. This would result in impacts to storm water infiltration and groundwater recharge. In addition, this increased urbanization would contribute to an increased demand for water supply and associated infrastructure, as well as an increased need for waste water treatment capacity. The Plan would contribute to a cumulatively considerable impact on water supply and water quality.

5.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL EFFECTS

Section 15126.2(c) of the CEQA Guidelines requires a discussion of any significant irreversible environmental changes that would be caused by the proposed project. Specifically, Section 15126.2(c) states:

> *Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible, since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irreversible commitments of resources should be evaluated to assure that such current consumption is justified.*

Generally, a project would result in significant irreversible environmental changes if any of the following would occur:

- The primary and secondary impacts would generally commit future generations to similar uses;
- The project would involve a large commitment of nonrenewable resources;
- The project involves uses in which irreversible damage could result from any potential environmental accidents associated with the project; or
- The proposed consumption of resources is not justified (e.g., the project involves the wasteful use of energy).

Resources that would be permanently and continually consumed by the proposed project's implementation include water, electricity, natural gas, fossil fuels, and aggregate resources; however, the amount and rate of consumption of these resources would not result in significant environmental impacts related to the unnecessary, inefficient, or wasteful use of resources. In addition, construction activities related to the proposed project would result in the irretrievable commitment of nonrenewable energy resources, primarily in the form of fossil fuels (including fuel oil), natural gas, and gasoline for automobile and construction equipment and aggregate supply used in construction.

With respect to operation activities, compliance with all applicable building codes, as well as project mitigation measures or project requirements, would help ensure that natural resources are conserved or recycled as feasible. It is also possible that new technologies or systems will emerge, or will become more cost-effective or user-friendly, that will further reduce the region's reliance upon nonrenewable natural resources; however, even with implementation of conservation measures consumption of natural resources would generally increase with implementation of the Plan.

A long-term increase in the demand for electrical and natural gas resources would occur. However, the proposed project would not involve wasteful or unjustifiable use of energy or other resources, and energy conservation efforts could also occur with new construction. In addition, new development associated with the proposed project will be constructed and operated in accordance with specifications contained in Tile 24 CCR. Therefore, the use of energy onsite would occur in an efficient manner.

5.3 GROWTH INDUCING IMPACTS

Section 15125.2(d) of the CEQA Guidelines requires that growth inducing impacts of a proposed project be considered. Growth inducing impacts are characteristics of a project that could directly or indirectly foster economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment. According to the CEQA Guidelines, such projects include those that would remove obstacles to population growth (e.g., a major expansion of a wastewater treatment plant) and projects that encourage and facilitate other activities that are beyond those proposed as part of the project and could affect the environment are growth inducing. In addition, as set forth in the CEQA Guidelines, increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. The CEQA Guidelines also state that it must not be assumed that growth in an area is necessarily beneficial, detrimental or of little significance to the environment. Induced growth is considered a significant impact only if it directly or indirectly affects the ability of agencies to provide needed public services or if it can be demonstrated that the potential growth, in some other way, significantly affects the environment, i.e., that it would result in construction that would adversely affect the environment.

Potential inducements to population growth include roads that provide access, the availability of adequate water supplies, the availability of sewage treatment facilities, the availabilities of developable land, the types and availability of employment opportunities, housing costs and availability, commuting distances, cultural amenities, climate, and local government growth policies contained in general plans and zoning ordinances.

Because a number of variables influence growth, it is difficult to determine how Plan alone would affect growth. As described in Sections 3.1 through 3.13 the 2012-2035 RTP/SCS would affect each of the categories described above directly through transportation projects and indirectly through land use strategies that would create a more compact development pattern than if no Plan were in place. The Plan would provide greater access to more of the region than the No Project Alternative due to transportation improvements; however targeting growth in the High Quality Transit Areas (HQTAs) would limit the geographic spread of growth. Nonetheless, the 2012-2035 RTP/SCS could influence and possibly induce growth into specific areas of the region by providing new or expanded access. Overall, the 2012-2035 RTP/SCS would accommodate and facilitate growth in the region.

6.0 PERSONS AND SOURCES CONSULTED

A number of technical reports and studies were utilized in the preparation of this Draft PEIR. These reports are referenced throughout this document where appropriate. In addition, this chapter documents all persons and sources that contributed in the preparation of this Draft PEIR.

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7.0 GLOSSARY

AB 32	Assembly Bill 32 – Signed into law on September 26, 2006, it requires that the state's global warming emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on global warming emissions that will be phased in starting in 2012. In order to effectively implement the cap, AB 32 directs the California Air Resources Board (ARB) to develop appropriate regulations and establish a mandatory reporting system to track and monitor global warming emissions levels.
ADA	Americans with Disabilities Act of 1990 – Guarantees equal opportunity for individuals with disabilities in public accommodations, employment, transportation, State and local government services, and telecommunications. It prescribes federal transportation requirements for transportation providers
AFP 42	United States Air Force Plant 42
afy	acre-feet per year
AHPA	Archaeological and Historic Preservation Act of 1974
AIRFA	The American Indian Religious Freedom Act
ALUC	Airport Land Use Commission
AQMP	Air Quality Management Plan – Regional plan for air quality improvement in compliance with federal and State requirements
ARB	California Air Resources Board – State agency responsible for attaining and maintaining healthy air quality through setting and enforcing emissions standards, conducting research, monitoring air quality, providing education and outreach, and overseeing/assisting local air quality districts.
ARPA	Archeological Resources Protection Act
asl	Above Sea Level
AVAPCD	Antelope Valley Air Pollution Control District
AVEK	Antelope Valley East Kern Water Agency
AVL	Automatic Vehicle Location
BAU	business-as-usual
BIA	Bureau of Indian Affairs
BLM	United States Bureau of Land Management
BMPs	Best Management Practice
BNSF	Burlington Northern Santa Fe Railway Co
BRT	Bus Rapid Transit
BUR	Bob Hope Airport(also known as Burbank Airport)
CA HST	California High Speed Train
CAAQS	California Ambient Air Quality Standards

Cal ARP	California Accidental Release Prevention Program
Cal/EPA	California Environmental Protection Agency
Cal-OSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation – State agency responsible for the design, construction, maintenance, and operation of the California State Highway System; as well as that portion of the Interstate Highway System within the State's boundaries.
CAT	Climate Action Team
CBSC	California Building Standards Code
CCA	California Coastal Act
CCAA	California Clean Air Act
CCR	California Code of Regulations
CCT	California Coastal Trail
CDC	California Department of Conservation
CDE	California Department of Education
CDFG	California Department of Fish and Game
CDPR	California Department of Park & Recreation
CEQA	California Environmental Quality Act – State law providing certain environmental protections that apply to all transportation projects funded with State funds.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CETAP	Community Environmental and Transportation Acceptability Process – Part of the Riverside County Integrated Project that is examining where to locate possible major new multi-modal transportation facilities to serve the current and future transportation needs of Western Riverside County, while minimizing impacts on communities and the environment.
CEUS	Commercial End-Use Survey
CFCP	California Farmland Conservancy Program
CFR	Code of Federal Regulations
CFS	Commodity Flow Survey
CGS	California Geology Survey
CH_4	methane
CHL	California History Landmark
CHP	California Highway Patrol
CIP	Capital Improvement Program
CIWMB	California Integrated Waste Management Board
CIWMP	Countywide Integrated Waste Management Plan
CMAs	Congestion Management Agencies

CMIA	Corridor Mobility Improvement Account
CMP	Congestion Management Program
CMS	Congestion Management System
CNEL	Community Noise Equivalent Level
CNDDB	California Natural Diversity Database
CO	Carbon monoxide – A colorless, odorless, poisonous gas formed when carbon in fuels is not burned completely. It is a byproduct of highway vehicle exhaust, which contributes about 60 percent of all CO emissions nationwide
CO_2	carbon dioxide
COG	Council of Governments – Under State law, a single or multi-county council created by a joint powers agreement.
COHb	carboxyhemoglobin
Corps	United States Army Corps of Engineers
COS	Los Angeles County Office of Sustainability
CRA	Colorado River Aqueduct
CSE	Countywide Siting Element
CSI	Container Security Initiative
CTC	California Transportation Commission – A nine-member board appointed by the governor to oversee and administer State and federal transportation funds and provide oversight on project delivery.
CTIP	Cargo Theft Interdiction Program
C-TPAT	Customs-Trade Partnership Against Terrorism
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
DBPs	disinfection byproducts
DFO	Disaster Field Office
DHS	United States Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000
DNL	Day-to-Night Average Noise Level
DOD	Department of Defense
DOSH	Division of Occupational Safety and Health
DPH	California Department of Public Health
DPM	diesel exhaust particulate matter
DSCA	Defense Support to Civilian Authorities
DTSC	Department of Toxic Substances
DWR	California Department of Water Resources manages the State's water supply.

EIR	Environmental Impact Report – An informational document, required under CEQA, which will inform public agency decision-makers and the public generally of: the significant environmental effects of a project, possible ways to minimize significant effects, and reasonable alternatives to the project.
EMA	California Emergency Management Agency
EMMA	Emergency Managers Mutual Aid
EOC	Emergency Operations Centers
EQIP	Environmental Quality Incentives Program
F	Fahrenheit
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration – Federal agency responsible for administering the Federal-Aid Highway Program, which provides federal financial assistance to construct and improve the National Highway System, urban and rural roads, and bridges.
FAA	Federal Aviation Administration – Federal agency responsible for issuing and enforcing safety regulations and minimum standards, managing air space and air traffic, and building and maintaining air navigation facilities.
FPPA	Farmland Protection Policy Act
FRPP	Farm and Ranchland Protection Program
FSZ	Farmland Security Zones
FTA	Federal Transit Administration – The federal agency responsible for administering federal transit funds and assisting in the planning and establishment of areawide urban mass transportation systems. As opposed to FHWA funding, most FTA funds are allocated directly to local agencies, rather than Caltrans.
FUA	Fuel Use Act
GHG	Greenhouse Gases – Components of the atmosphere that contribute to the greenhouse effect. The principal greenhouse gases that enter the atmosphere because of human activities are carbon dioxide, methane, nitrous oxide, and fluorinated gases
GIS	Geographic Information System – Powerful mapping software that links information about where things are with information about what things are like. GIS allows users to examine relationships between features distributed unevenly over space, seeking patterns that may not be apparent without using advanced techniques of query, selection, analysis, and display.
HAPS	hazardous air pollutants
HARP	Hotspots Analysis and Reporting Program
HCD	California Department of Housing and Community Development
HCP	Habitat Conservation Plan
HMGP	Hazard Mitigation Grant Program

HOT	High Occupancy Toll – An HOV lane that single-occupant drivers can pay to drive in.
HOV	High Occupancy Vehicle – A lane restricted to vehicles with two (and in some cases three) or more occupants to encourage carpooling. Vehicles include automobiles, vans, buses and taxis.
HQTAs	High Quality Transit Areas
HRA	Health Risk Assessment
HSA	Historic Sites Act
HST	High Speed Train
HUC	Hydrologic Unit Code
ICAPCD	Imperial County Air Pollution Control District – Local air pollution control agency mandated by State and federal regulations to implement and enforce air pollution rules and regulations
ICS	Incident Command System
ICTF	Intermodal Container Transfer Facility
IGR	Intergovernmental Review Process – the review of documents by several governmental agencies to ensure consistency of regionally significant local plans, projects, and programs with SCAG's adopted regional plans.
IIPP	Injury and Illness Prevention Program
IID	Imperial Irrigation District
IOS	Initial Operating Segment.
IRWMP	integrated Regional Water Management Plan update (IRWMP)
ISPS	International Ship and Port Facility Security Code
ISTEA	Intermodal Surface Transportation Efficiency Act – Signed into federal law on December 18, 1991, it provided authorization for highways, highway safety and mass transportation for Fys 1991−1997 and served as the legislative vehicle for defining federal surface transportation policy.
ITAs	
ITS	Intelligent Transportation Systems – Systems that use modern detection, communications and computing technology to collect data on system operations and performance, communicate that information to system managers and users, and use that information to manage and adjust the transportation system to respond to changing operating conditions, congestion or accidents.
IVAG	Imperial Valley Association of Governments – Council of Governments for Imperial County. IVAG is responsible for short-range transportation planning, including all projects utilizing federal and State highway and transit funds
kWh	Kilowatt Hours
LAA	Los Angeles Aqueduct
LAFCO	Local Agency Formation Commission

LATC	Los Angeles Transportation Center
LAX	Los Angeles International Airport
LAWA	Los Angeles World Airports – aviation authority of the City of Los Angeles. LAWA owns and operates Los Angeles International (LAX), Ontario International, Van Nuys, and Palmdale Airports.
LCP	Local Coastal Program
LEA	Local Enforcement Agency
LEED	US Green Building Council's Leadership in Energy and Environmental Design
LGB	Long Beach Airport
LOSSAN	Los Angeles to San Diego Corridor
LRID	Little Rock Irrigation District
LRT	Light Rail Transit – A mode of transit that operates on steel rails and obtains its power from overhead electrical wires. LRT may operate in single or multiple cars on separate rights-of-way or in mixed traffic
LUST	Leaking Underground Storage Tank
MAA	Mutual Aid Agreements
MACT	Maximum Achievable Control Technology
maf	million acre feet
MAP	Million Annual Passengers – Used to quantify airport activity.
MATES-III	Multiple Air Toxics Exposure Study
MCL	Maximum Contaminant Level
MBTA	Migratory Bird Treaty Act
MDAB	Mojave Desert Air Basin – Area defined by State law as comprising the desert portions of Los Angeles, Kern, Riverside, and San Bernardino Counties.
MEI	Maximum Exposed Individual
Metro	Los Angeles County Metropolitan Transportation Authority - agency responsible for planning and funding countywide transportation improvements, administering the county's transportation sales tax revenues, and operating bus and rail transit service
Metrolink	Regional commuter rail system connecting Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties and operated by SCRRA.
mm/yr	millimeters per year
MPH	miles per hour
MPO	Metropolitan Planning Organization – A federally required planning body responsible for transportation planning and project selection in a region.
MTBE	Methyl Tertiary Butyl Ether
MWA	Mojave Water Agency

MWD	Metropolitan Water Department of Southern California is a consortium of 26 cities and water districts, and is the largest single provider of drinking water to Southern California. MWD provides water for an estimated 18 million people.
NAAQS	National Ambient Air Quality Standards – Targets established by the U.S. Environmental Protection Agency (EPA) for the maximum contribution of a specific pollutant in the air.
NCCP	Natural Communities Conservation Plan – Program under the Department of Fish and Game that uses a broad-based ecosystem approach towards planning for the protection of plans, animals and their habitats; while allowing compatible and appropriate economic activity.
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NEPA	National Environmental Protection Act – Federal environmental law that applies to all projects funded with federal funds or requiring review by a federal agency.
NHL	National Historic Landmark
NIMS	National Incident Management System – Nationwide template that enables all government, private-sector and non-governmental organization to work together during a domestic incident.
NOP	Notice of Preparation
NPDWRs	National Primary Drinking Water Regulations
NPL	National Priority List
NRF	National Response Framework
NOx	Nitrogen oxides – A group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. Nox is a major component of ozone and smog, and is one of six principal air pollutants tracked by the EPA.
O&M	Operations and Maintenance – The range of activities and services provided by the transportation system and the upkeep and preservation of the existing system.
O3	ozone
OCTA	Orange County Transportation Authority – Agency responsible for planning and funding county-wide transportation improvements, administering the county's transportation sales tax revenues, and operating bus transit service.
OEMS	Office of Emergency Services
OES	Office of Hazardous Materials Safety
ONT	LA/Ontario International Airport
Pb	Lead
PCH	Pacific Coast Highway

PEIR	Program Environmental Impact Report – Environmental review process used to evaluate the potential environmental effects of large-scale plans or programs.
PM10	Particulate Matter – A mixture of solid particles and liquid droplets found in the air, 10 micrometers or less in size (a micrometer is one-millionth of a meter). These coarse particles are generally emitted from sources such as vehicles traveling on unpaved roads, materials handling, and crushing and grinding operations, as well as windblown dust.
PM2.5	Particulate Matter – A mixture of solid particles and liquid droplets found in the air, 2.5 micrometers or less in size (a micrometer is one-millionth of a meter). These fine particles result from fuel combustion from motor vehicles, power generation, and industrial facilities, as well as from residential fireplaces and wood stoves.
PMD	Palmdale Regional Airport
POEs	Ports of Entry
PSP	Palm Springs International Airport
PWD	Palmdale Water District
RCP	Regional Comprehensive Plan – Developed by SCAG, the RCP is a vision of how Southern California can balance resource conservation, economic vitality, and quality of life. It will serve as a blueprint to approach growth and infrastructure challenges in an integrated and comprehensive way.
RCRA	Resource Conservation and Recovery Act
RCTC	Riverside County Transportation Commission – Agency responsible for planning and funding countywide transportation improvements and administering the county's transportation sales tax revenues.
REOC	Regional Emergency Operations Center
ROG	Reactive organic gas – Organic compounds assumed to be reactive at urban/regional scales. Those organic compounds that are regulated because they lead to ozone formation.
RHNA	Regional Housing Needs Assessment – Quantifies the need for housing within each jurisdiction of the SCAG Region based on population growth projections. Communities then address this need through the process of completing the housing elements of their general plans.
ROG	Reactive organic gas – Organic compounds assumed to be reactive at urban/regional scales. Those organic compounds that are regulated because they lead to ozone formation.
RTA	Riverside Transit Agency
RTDM	Regional Travel Demand Model
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan – Federally required 20-year plan prepared by metropolitan planning organizations and updated every three years. Includes projections of population growth and travel demand, along with a specific list of proposed projects to be funded.

RTSS	regional transit security strategy
RWQCB	Regional Water Quality Control Boards - Responsible for planning and enforcement of water quality regulations for their respective regions, in support of the State Water Quality Control Board, which sets State standards and regulations.
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users – Signed into law by President Bush on August 10, 2005, it authorized the Federal surface transportation programs for highways, highway safety, and transit for the 5-year period of 2005-2009.
SANBAG	San Bernardino Associated Governments
SB	Senate Bill
SBD	San Bernardino Airport – International airport located in San Bernardino.
SCAB	South Coast Air Basin – Comprises the non-Antelope Valley portion of Los Angeles County, Orange County, Riverside County, and the non-desert portion of San Bernardino County.
SCAG	Southern California Association of Governments – The metropolitan planning organization (MPO) for six counties including Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial.
SCAQMD	South Coast Air Quality Management District – The air pollution control agency for Orange County and major portions of Los Angeles, San Bernardino and Riverside Counties in Southern California.
SCCAB	South Central Coast Air Basin – comprises San Luis Obispo, Santa Barbara, and Ventura Counties.
SCE	Southern California Edison
SCRRA	Southern California Regional Rail Authority – Formed in August 1991, the SCRRA plans, designs, constructs and administers the operation of regional passenger rail lines (Metrolink) serving the counties of Los Angeles, Orange, Riverside, San Bernardino and Ventura.
SCS	Sustainable Communities Strategy
SDWA	Safe Drinking Water Act
SEMS	Standardized Emergency Management System
SHPO	California State Office of Historic Preservation
SIPS	State Implementation Plan – State air quality plan to ensure compliance with State and federal air quality standards. In order to be eligible for federal funding, projects must demonstrate conformity with the SIP.
SMARA	Surface Mining Area Reclamation Act
SNA	John Wayne Airport
SOAR	Save Open Space and Agricultural Resources
SO_X	Sulfur Oxide – Any of several compounds of sulfur and oxygen, formed from burning fuels such as coal and oil.
SR	State Route

SRTS	Safe Routes to School
SSAB	Salton Sea Air Basin – Comprises the Coachella Valley portion of Riverside County and all of Imperial County.
SSPP	System Safety Program Plan
STRAHNET	Strategic Highway Network
SWP	State Water Project
SWRCB	State Water Resources Control Board
SWQCB	State Water Quality Control Board
TACs	Toxic Air Contaminants
TAZ	Traffic Analysis Zone – Zone system used in travel demand forecasting.
TCM	Transportation Control Measure – A project or program that is designed to reduce emissions or concentrations of air pollutants from transportation sources. TCMs are referenced in the State Implementation Plan (SIP) for the applicable air basin and have priority for programming and implementation ahead of non-TCMs.
TDA	Transportation Demand Management – Strategies that result in more efficient use of transportation resources, such as ridesharing, telecommuting, park and ride programs, pedestrian improvements, and alternative work schedules.
TDM	Transportation Demand Management – Strategies that result in more efficient use of transportation resources, such as ridesharing, telecommuting, park and ride programs, pedestrian improvements, and alternative work schedules.
TEA-21	Transportation Equity Act for the 21st Century – The predecessor to SAFETEA-LU, it was signed into federal law on June 9, 1998. TEA-21 authorized the federal surface transportation programs for highways, highway safety, and transit for the six-year period 1998−2003. TEA-21 builds upon the initiatives established in ISTEA.
TEU	Twenty-foot Equivalent Unit, a measure of shipping container capacity.
TIP	Transportation Improvement Program
TMCs	Transportation Management Centers
TMDL	Total Maximum Daily Loads are a cap on the amount of a specific pollutant that a waterbody can safely absorb. TMDLs are set at both the Federal and State level and are enforced by the Water Quality Boards and the EPA.
TOAL	take-offs and landings
TOC	Total Organic Carbon
TOD	Transit-Oriented Development – A planning strategy that explicitly links land-use and transportation by focusing mixed housing, employment and commercial growth around bus and rail stations (usually within ½ mile). TODs can reduce the number and length of vehicle trips by encouraging more bike/ped and transit use, and can support transit investments by creating the density around stations to boost ridership.
TOG	total organic gas

TPP	Transit Priority Project
TSA	Transportation Security Administration
TSM	Transportation Systems Management
TSWG	Transportation Security Working Group
U.S.C.	United States Code
UBC	Uniform Building Code
UP	Union Pacific Railroad
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USDOT	U.S. Department of Transportation – Federal agency responsible for the development of transportation policies and programs that contribute to providing fast, safe, efficient, and convenient transportation at the lowest cost consistent with those and other national objectives, including the efficient use and conservation of the resources of the United States. USDOT is comprised of ten operating administrations, including FHWA, FTA, FAA, and FRA
USEPA	Environmental Protection Agency – Federal agency established to develop and enforce regulations that implement environmental laws enacted by Congress to protect human health and safeguard the natural environment.
USFS	United States Forest Service
USFWS	Unites States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
VCAPCD	Ventura County Air Pollution Control District
VCTC	Ventura County Transportation Commission – Agency responsible for planning and funding county-wide transportation improvements.
VCV	Southern California Logistics Airport
VHD	Vehicle Hours of Delay – The travel time spent on the highway due to congestion. Delay is estimated as the difference between vehicle hours traveled at a specified free flow speed and vehicle hours traveled at a congested speed.
VMT	Vehicle Miles Traveled – On highways, a measurement of the total miles traveled by all vehicles in the area for a specified time period. It is calculated by the number of vehicles times the miles traveled in a given area or on a given highway during the time period. In transit, the number of vehicle miles operated on a given route or line or network during a specified time period.
WAP	Wildlife Action Plan
WDRs	Water Discharge Requirements
Williamson Act	California Land Conservation Act
ZEVs	Zero-Emission Vehicles

VOC	Volatile Organic Compounds – Organic gases emitted from a variety of sources, including motor vehicles, chemical plants, refineries, factories, consumer and commercial products, and other industrial sources. Ozone, the main component of smog, is formed from the reaction of VOCs and NOx in the presence of heat and sunlight.
PHEV	plug in electric hybrids

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Ventura County
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