Draft 2008 Regional Transportation Plan Program Environmental Impact Report

January 2008

SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

SCH# 2007061126

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Mission Statement

Leadership

Vision

Progress

Leadership, vision and progress which promote economic growth, personal well-being, and livable communities for all Southern Californians.

The Association will accomplish this Mission by:

- **Developing long-range regional plans and strategies that provide for efficient movement of people, goods and information; enhance economic growth and international trade; and improve the environment and quality of life.**
- **Providing quality information services and analysis for the region.**
- **Using an inclusive decision-making process that resolves conflicts and encourages trust.**
- **Creating an educational and work environment that cultivates creativity, initiative, and opportunity.**

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EXECUTIVE SUMMARY

Introduction

Purpose of the Environmental Impact Report

In accordance with the California Environmental Quality Act (CEQA) the Southern California Association of Governments (SCAG) has prepared this Program Environmental Impact Report (PEIR) for the 2008 Regional Transportation Plan (2008 RTP, Plan, or Project). The Plan addresses the transportation needs for the SCAG region through 2035 (including both specific projects and strategies that address transportation and urban form); the purpose of the 2008 PEIR is to identify the potentially significant environmental effects of implementing the projects, programs, and policies included in the Plan. The PEIR serves as an informational document to inform decision-makers and the public of the potential environmental consequences of approving the proposed 2008 RTP, and it includes feasible mitigation measures and alternatives designed to help avoid or minimize significant environmental effects. The PEIR includes a description of the existing regional environmental setting, a description of the proposed Project or action, a reasonable range of alternatives to the proposed Plan, analysis and identification of significant impacts of the Plan and the alternatives, identification of the environmentally superior alternative, areas of known controversy, mitigation measures, and the expected level of significance after mitigation.

The 2008 RTP PEIR fulfills the requirements of CEQA and provides a useful, regional-scale environmental planning tool that will support subsequent, site-specific analysis, and identifies appropriate measures to minimize adverse environmental effects in the SCAG region. Individual projects are preliminarily identified in the 2008 RTP; 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. 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.

Environmental Setting

The SCAG region is comprised of six counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura and totals approximately 38,000 square miles in area. The region stretches from the 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. This vast region includes nearly 25 million acres of which approximately 2.1 million acres is developed land, nearly 20 million acres are vacant, and the balance is agriculture, open space, recreation and other uses. The region is home to a population of nearly 19 million people and is expected to grow to 24 million by 2035.

Proposed Action

SCAG is the federally designated Metropolitan Planning Organization under Title 23, United States Code (USC) 134(d)(1), for the six-county region. SCAG is required by state and federal mandates to prepare a Regional Transportation Plan (RTP) every four years.

The 2008 RTP 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 consistent with the RTP in order to receive federal funding. The RTP includes a policy element with goals, policies, and performance indicators, an action element that identifies projects, programs and implementation. In addition, the RTP includes a description of regional growth trends to help identify future needs for travel and goods movement. The 2008 RTP consists of two sections: a financially constrained plan and a strategic plan. While the constrained plan includes projects that have committed, available, or reasonably available revenue sources, the strategic plan 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's constrained plan.

Policy Element

The goals of the 2008 RTP have expanded from 2004 to encompass transportation security. These goals reflect the requirements of the United States Department of Transportation as identified in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The goals are provided in Table ES-1 below in no particular order.

TABLE ES-1
RTP GOALS

RTP Goals
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 security of our transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies
Maximize the productivity of our transportation system
Protect the environment, improve air quality and promote energy efficiency
Encourage land use and growth patterns that complement our transportation investments

SOURCE: Southern California Association of Governments, 2008 Regional Transportation Plan

The SCAG Regional Council adopted five policies to guide the development of the RTP (Table ES-2). These RTP policies, listed in Table ES-2 below, are unchanged since 2004 when the previous RTP was prepared by SCAG, and they emphasize the importance of tracking the Plan's performance through specific indicators.

TABLE ES-2
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 will be RTP priorities and will be balanced against the need for system expansion investments.
3	RTP land-use and growth strategies that differ from currently expected trends will require a collaborative implementation program that identifies required actions and policies by all affected agencies and subregions.
4	HOV gap closures that significantly increase transit and rideshare usage will be supported and encouraged, subject to Policy No. 1.
5	Progress monitoring on all aspects of the Plan, including timely implementation of projects, programs, and strategies, will be an important and integral component of the Plan.

SOURCE: Southern California Association of Governments, 2008 Regional Transportation Plan

Performance indicators in the 2008 RTP include mobility, accessibility, reliability, safety, cost effectiveness, productivity, sustainability, preservation, environmental quality, and environmental justice.

Transportation Strategies

The programs, projects and implementation actions of the 2008 RTP focus on system management, transportation demand management, strategic expansion and the land use transportation connection.

Transportation Safety

The 2008 RTP details ten measures that SCAG, as a planning agency, will undertake to enhance the region's ability to achieve and sustain at risk target levels of capability to prevent, protect against, respond to and recover from major human caused or natural events in order to minimize the threat and impact to lives, property and the region. The 2008 RTP commits $10 billion for safety related projects and services. Furthermore, in 2005, SAFETEA-LU required that each state develop a Strategic Highway Safety Plan; the 2008 RTP 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 2008 RTP. As discussed above, SCAG has developed performance measures to track and monitor the progress of the transportation system so that the region can make informed decisions regarding transportation investments. 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.

Travel Demand Management (TDM)

In an effort to address travel demand, TDM strategies are designed to influence an individual's travel behavior by making alternatives to the single-occupant automobile more attractive, especially during peak commute periods, or by enacting regulatory strategies. Some examples of TDM strategies are carpools and vanpools, public transit, non-motorized modes, congestion pricing, and providing the public with reliable and timely traveler information.

Increasing Rideshare (Carpool and Vanpool)

The SCAG region continues to invest heavily in High Occupancy Vehicle (HOV) infrastructure that provides incentives for commuters to share rides with others. While HOV utilization is growing over time, the percent of total travelers using carpools and vanpools is not. SCAG and its partners will strengthen their efforts to encourage this efficient mode of travel.

System Expansion Projects

More than half of the available transportation revenues in the region are dedicated to the completion and expansion of the region's people and goods movement transportation systems.

Highway Improvements

Major categories of highway improvements included in the Plan are HOV lanes and connectors, mixed flow (or general purpose) lanes, toll facilities and High Occupancy Toll (HOT) lanes, and strategic arterial improvements. A significant number of system expansion projects have already been committed through SCAG's Regional Transportation Improvement Program (RTIP) for the highway network. These priority projects close critical gaps in the system, relieve significant bottlenecks, and address inter-county travel needs.

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 rideshare rates. The Plan includes many additional investments to extend the HOV network, strategically closes gaps in the HOV network, and constructs additional direct freeway-to-freeway connectors to maximize the overall system performance by minimizing weaving conflicts and maintaining travel speeds.

Mixed Flow

Mixed flow lanes carry more traffic than any other component of our transportation system; mixed-flow capacity enhancements are 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 2008 RTP includes a variety of mixed flow lane additions, mostly outside of Los Angeles County.

Toll and High Occupancy Toll (HOT) Lane Corridors and Facilities

The 2008 RTP also includes an expansion of the existing HOT lane and toll road system in Orange County to address the congested commuter corridor between housing-rich Riverside County and job-rich Orange County. Additionally, improvements to several major corridors in other parts of the region are proposed to be financed by tolls, including the I-710 Tunnel Gap Closure and the High Desert Corridor.

Transit Strategies

The 2008 RTP recommends closing critical gaps in the transit system to improve service, and extend routes to serve a greater number of passengers. 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.

Heavy and light rail projects are planned for Los Angeles County, while Orange County focuses on several new bus rapid transit (BRT) corridors. Riverside and San Bernardino Counties are planning a mix of new rail and BRT projects.

High-Speed Regional Transport

A High-Speed Regional Transport (HSRT) system has the potential for relieving both airport and freeway congestion in urbanized areas by providing an alternative to the automobile, as well as making less congested airports more accessible to air travelers, and providing alternative capacity for freight movement in the region.

Aviation

SCAG's Regional Aviation Decentralization Strategy is very similar to the 2030 decentralized regional aviation system adopted for the 2004 RTP. It respects all legally-enforceable policy and physical capacity constraints at urban airports. It also assumes much more willingness on the part of the airlines to invest in new flights at new and emerging airports, and a package of market and ground access incentives to promote decentralization at under-utilized suburban airports.

Goods Movement Strategies

To enable the region to handle the dramatic growth in the goods movement sector, the Plan calls for approximately $13 billion in freight rail investments, nearly $18 billion in a freight HSRT

system, and over $5 billion in highway investments. These investments integrate air quality mitigation into the goods movement system improvements, yielding substantial air quality benefits and reducing its current and long-term impacts on public health and the environment.

Dedicated Lanes for Clean Technology Trucks

The past several RTP updates have included the concept of dedicated truck facilities. The 2008 RTP continues to refine the concept of user-supported (toll) corridors to improve the flow of goods. More recent efforts have focused on adding dedicated truck lanes for clean technology vehicles along truck-intensive corridors in Southern California. Operationally, such a corridor would be aligned to connect freight-intensive locations such as the Ports, warehousing/distribution center locations, and manufacturing locations. These dedicated facilities would have fewer entrance/egress locations than typical urban interstates to smooth the flow of trucks.

Regional Freight Rail Investment and Emission Reduction Package

Freight rail investments consist of additional mainline capacity, grade separations, and locomotive engine upgrades. About half of the rail-related investments are for grade crossing separations, which reduce traffic congestion, improve safety, and reduce pollution. Substantial air quality benefits can be realized by accelerating fleet modernization with cleaner technologies.

Alternative Technology-Based Goods Movement/Logistics

Also being explored in the 2008 RTP are alternative technology-based systems that can provide greater throughput and reliability with fewer emissions than traditional rail (the emissions would be only those associated with electricity generation).

Environmental Justice

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. In the transportation-planning context, SCAG seeks to assure that the plan benefits and burdens are not inequitably distributed within the region. A detailed analysis of the environmental justice analysis and methodology is contained in the Plan.

Proposed Plan and RTP PEIR Alternatives

The alternatives evaluated for the 2008 RTP PEIR include:

The **Proposed Plan**, which includes all of the elements summarized above, contains transportation/urban form strategies that encourage compact growth, increased jobs/housing balance, and centers based development where feasible, in all parts of the region.

The **No Project** Alternative includes only those programmed transportation projects that received federal environmental clearance by December 2006, projects in the first year of the 2006 RTIP and projects currently undergoing construction or right of way approval. These reasonably foreseeable projects fulfill the definition of the CEQA mandated "No Project Alternative."

The **2004 Modified RTP** Alternative is an update of the adopted 2004 RTP to reflect the most recent growth estimates and transportation planning decisions and assumptions. This alternative does not include urban form strategies included within SCAG's Compass Blueprint program to the extent included within the Plan.

The **Envision** Alternative builds on the enhanced density and ideas of the SCAG Compass Blueprint and described in the Plan and goes further. It includes far more aggressive densities than the Proposed Plan alternative and limits the development of single-family housing that would be built in the region.

Table ES-3 below contains a summary of the environmental impacts associated with implementation of the 2008 RTP and alternatives, proposed mitigation measures, the level of impacts with implementation of the mitigation measures.

Each alternative maintains a constant population total in 2035. The year 2035 growth projection for each Alternative differs from one another only in the distribution of people, households and jobs. The alternatives differ in terms of the distribution because the different transportation investments and urban form strategies that would be expected to support different regional distributions of population, households, and employment.

Analytical Approach

The focus of the environmental analysis in this PEIR is on the potential regional-scale and cumulative impacts of implementation of the Plan and the alternatives. The long-range planning horizon of more than 25 years necessitates that many of the highway, arterial, goods movement, and transit projects included in the 2008 RTP and the alternatives are identified at the conceptual level, and this document addresses environmental impacts to the level that they can be assessed without undue speculation. This PEIR acknowledges this uncertainty and incorporates these realities into the methodology to evaluate the environmental effects of the 2008 RTP, given its long-term planning horizon.

The proposed Plan and the alternatives were evaluated at an equal level of detail. Multiple methods, including spatial analysis, transportation, noise and air quality simulation modeling, and other quantitative, ordinal, and qualitative techniques, were employed to identify the potential environmental effects of implementing the Plan and the alternatives. Spatial analysis using Geographic Information Systems (GIS) was employed to evaluate the potential effects of the

major roadway, rail, and transit projects on numerous resource categories, such as land use, biological, cultural and water resources. Sophisticated transportation, noise and air quality simulation models were used to estimate the transportation and air quality impacts. Project and policy elements of the Plan and alternatives were incorporated into the modeling analysis and into the socioeconomics projections. All of the techniques used to evaluate the potential environmental effects of the Plan and the alternatives are fully described in each resource section in Chapter Three of this document.

Baseline for Determining Significance

The PEIR must identify significant impacts that would be expected to result from implementation of the 2008 RTP. 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 Three of this document, and represents the most recent, reliable, and representative data to describe current regional conditions. The criteria for determining significance are included in each resource section in Chapter Three of this document.

Comparison with the No Project

It is important to emphasize the urbanization in the SCAG region will increase substantially by 2035, with or without implementation of the 2008 RTP. This means that the impact assessment for many of the resource categories of the CEQA required environmental baseline (current conditions) of current conditions 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 2008 RTP. A direct comparison between the Plan and the No Project Alternative is included in each resource section of Chapter Three of this document.

Significant Impacts, Mitigation Measures, and Monitoring

As stated above, CEQA requires identification of significant impacts and mitigation measures to avoid or reduce significant impacts. **Table ES-3** below contains a summary of the environmental impacts associated with implementation of the 2008 RTP and RTP PEIR Alternatives, proposed mitigation measures, and the level of impacts with implementation of the mitigation measures. The table illustrates that substantial or potentially substantial adverse effects, compared to current conditions, would be expected to occur to:

- Land Use;
- Population, Employment, and Housing;
- Transportation;
- Air Quality;
- Noise;
- Visual/Aesthetic Resources;

- Open Space;
- Biological Resources;
- Cultural Resources;
- Geology;
- Hazardous Materials;
- Energy;
- Water Resources; and
- Public Service and Utilities.

The proposed mitigation measures included in Table ES-3 can be incorporated as policies into the Final 2008 RTP and SCAG's updated Regional Comprehensive Plan, as appropriate and feasible. This integration of mitigation with regional plans helps to ensure that feasible measures are implemented at the project-level (Public Resource Code §21081.6). The project proponent or local jurisdiction shall be responsible for ensuring adherence to the mitigation measures prior to construction. SCAG shall be provided with documentation of compliance with mitigation measures through SCAG's monitoring efforts, including SCAG's Intergovernmental Review Process (in which all regionally significant projects, plans, and programs are reviewed for consistency with regional plans and policies).

Areas of Known Controversy

Areas of known controversy about the 2008 RTP include concerns raised about growth projections, implementation of urban form strategies and mitigation measures, integration with SCAG's Regional Comprehensive Plan, water supply reliability, the transportation funding strategy, and reducing greenhouse gas (GHG) emissions from the transportation network.

Acronym List

The following represents frequently used acronyms contained within this document; a comprehensive glossary is included in Chapter 7:

CEQA	California Environmental Quality Act
GIS	Geographic Information Systems
GHG	Greenhouse Gas
HOV	High Occupancy Vehicle
HSRT	High Speed Regional Transport
LAX	Los Angeles Airport
MPH	Miles per Hour
MPO	Metropolitan Planning Organization
PEIR	Program Environmental Impact Report
Plan	2008 Regional Transportation Plan
PRC	Public Resources Code
RTP	Regional Transportation Plan
SCAG	Southern California Association of Governments
USC	United States Code

Table ES-3: 2008 RTP Impacts, Mitigation Measures and Comparison of Alternatives

IMPACT	MITIGATION MEASURES	2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
As noted in Chapter 3.0, 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.					
3.1 <u>Aesthetics</u>					
Impact 3.1-1: Construction and implementation of individual 2008 RTP projects could obstruct views of scenic resources or scenic vistas.	**MM-AV.1:** Prior to project approval, project implementation agencies shall implement design guidelines, local policies, and programs aimed at protecting views of scenic corridors and avoiding visual intrusions. Projects shall 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 projects shall minimize their intrusion into important viewsheds and use contour grading to better match surrounding terrain. **MM-AV.2:** Prior to the issuance of permits, project implementation agencies shall require and projects shall, to the extent feasible, construct noise barriers of materials whose color and texture complements the surrounding landscape and development. Noise barriers shall 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. Landscaping shall use natural landscaping to minimize contrasts between the project and surrounding areas. Wherever possible, interchanges and transit lines at the grade of the surrounding land shall limit view blockage. The edges of major cut and fill slopes shall be contoured to provide a more natural-looking finished profile.	It is likely there will be situations where visual impacts cannot be mitigated to a less than significant. Therefore, impacts to visual resources would remain **significant** after mitigation.	S-	S=	S=
Impact 3.1-2: Construction and implementation of projects in the 2008 RTP could potentially alter the appearance of scenic resources along or near designated scenic highways and vista points.	**MM-AV.3:** Project implementation agencies shall, where practicable and feasible, avoid construction of transportation facilities in state and locally designated scenic highways and/or vista points. **MM-AV.4:** Prior to project approval, project implementation agencies shall complete design studies for projects in designated or eligible Scenic Highway corridors 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-AV.5:** If transportation facilities are constructed in state- and locally-designated scenic highways and/or vista points, design, construction, and operation of the transportation facility shall be	It is likely there will be situations where visual impacts cannot be mitigated to a less than significant. Therefore, impact to visual resources would remain **significant** after mitigation.	S-	S=	S=

<u>Key:</u>
+ Greater Adverse Impact than Proposed 2008 RTP
= Similar Impact as Proposed 2008 RTP
- Less Adverse Impact than Proposed 2008 RTP
B = Beneficial
LTS = Less-than-Significant
S = Significant
N = No Impact

Table ES-3: 2008 RTP Impacts, Mitigation Measures and Comparison of Alternatives

IMPACT	MITIGATION MEASURES		2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
		consistent with applicable guidelines and regulations for the preservation of scenic resources along the designated scenic highway.				
Impact 3.1-3: Construction and implementation of projects included in the 2008 RTP could 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-AV.6:**	Project implementation agencies shall develop design guidelines for each type of transportation facility that make elements of proposed facilities visually compatible with surrounding areas. Visual design guidelines shall, at a minimum, include setback buffers, landscaping, color, texture, signage, and lighting criteria. The following methods shall be employed whenever possible: • Transportation systems shall be developed to be compatible with the surrounding environment (i.e., colors and materials of construction material). • Vegetation used as screening shall blend in and complement the natural landscape. • Trees bordering highways shall remain or be replaced so that clear-cutting is not evident. • Grading shall blend with the adjacent landforms and topography.	It is likely there will be situations where visual impacts cannot be mitigated to a less than significant. Therefore, impact to visual resources would remain **significant** after mitigation.	S-	S=	S-
	MM-AV.7:	Project implementation agencies shall design projects to minimize contrasts in scale and massing between the project and surrounding natural forms and development. Project implementation agencies shall 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 shall be designed to add significant natural elements and visual interest to soften the hard-edged, linear travel experience that would otherwise occur.				
	MM-AV.8:	Project implementation agencies shall use natural landscaping to minimize contrasts between the project and surrounding areas. Wherever possible, interchanges and transit lines shall be designed at the grade of the surrounding land to limit view blockage. Edges of major cut-and-fill slopes should be contoured to provide a more natural looking finished profile. Project implementation agencies shall replace and renew landscaping to the greatest extent possible along corridors with road widenings, interchange projects, and related improvements. New corridor landscaping shall be designed to respect existing natural and man-made features and to complement the dominant landscaping of surrounding areas.				
	MM AV.9:	Project implementation agencies shall construct sound walls of				

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IMPACT	MITIGATION MEASURES	2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
	materials whose color and texture complements the surrounding landscape and development and to the maximum extent feasible, use color, texture, and alternating facades to "break up" large facades and provide visual interest. Where there is room, project sponsors shall landscape the sound walls with plants that screen the sound wall, preferably with either native vegetation or landscaping that complements the dominant landscaping of surrounding areas.				
Cumulative Impact 3.1-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP influences the pattern of this urbanization, by increasing mobility and including land-use-transportation measures. At the regional scale, the 2008 RTP's contribution to impacts on the overall visual character of the existing landscape setting would be cumulatively significant.	Mitigation measures identified above (MM-AV.1 through MM-AV.9) for 2008 RTP projects should also be implemented as applicable to development projects throughout the region. **MM-AV.10:** In visually sensitive site areas and prior to project approval, local land use agencies shall 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.	This impact would remain **significant** because the population growth projected by 2035 in combination with the projects in the 2008 RTP would consume approximately 2000,000 acres of land that is currently vacant resulting in contrasts with the overall visual character of the existing landscape setting.	S+	S+	S-
3.2 <u>Air Quality</u>					
Impact 3.2-1: Under the Plan, long-term emissions of PM10 and PM2.5 would increase substantially, when compared to existing conditions (2008). PM10 would increase in the SCAB, San Bernardino portion of MDAB and Imperial County portion of SSAB, and PM2.5 emissions would increase in the SCAB; PM10 would increase in Los Angeles, Orange, Riverside and San Bernardino Counties, PM2.5 would increase in Los Angeles and Riverside Counties, as a result of on-road mobile sources. The increase in regional emissions of PM10 and PM2.5 would be considered a significant cumulative impact. Emissions of ROG, NOx, CO, and SOx would decrease when compared to 2008; this would be a beneficial impact.	Emissions of particulate matter are directly related to growth and VMT. Regardless of how clean a vehicle operates, the vast majority of PM10 and PM2.5 emissions from on-road sources are generated from re-entrained dust on paved roads and is a function of the vehicle miles traveled. Mitigation measures that reduce VMT are proposed. Additional measures to control fugitive dust and transportation-related PM10 and PM2.5 are outlined in the 2007 Air Quality Management Plan (AQMP) and include control methods, such as watering, chemical stabilization, paving, revegetation, track-out control, construction project signage, sweeping and motor vehicle controls. Mitigation measures from the following air quality management plans are hereby incorporated by reference: • 2007 South Coast Air Quality Management Plan (AQMP) South Coast Air Quality Management District Mitigation	After implementation of all feasible mitigation measures and incorporation of measures as described above, the project and cumulative development would have a **significant** and unavoidable impact on regional air quality (PM10 and PM2.5).	S+	S=	S-

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Table ES-3: 2008 RTP Impacts, Mitigation Measures and Comparison of Alternatives

IMPACT	MITIGATION MEASURES	2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
	Measures and Control Efficiencies for the following: Off-road Engines On-road Engines Harbor Craft Ocean-going Vessels Locomotives Fugitive Dust • Mojave Desert Air Quality Management Plan • Antelope Valley Air Quality Management Plan • Imperial County Air Quality Management Plan **MM-AQ.1:** Pursuant to CAA Section 108(f)(1)(A), Transportation Control Measures (TCMs) from the 2007 AQMP include the following sixteen measures: 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;				

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	XII. Programs to reduce motor vehicle emissions, consistent with Title II of the Clean Air Act, 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 2008 RTP has been prepared to facilitate implementation of the transportation control measures outlined in the 2007 AQMP. The 2008 RTP incorporates both the capital and noncapital improvements recommended by the AQMP. **MM-AQ.2:** ARB has adopted a series of measures designed to attain federal air quality standards for PM2.5 and 8-hour ozone. ARB's strategy, outlined in the South Coast SIP, 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: *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				

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	• 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* • 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.				
Impact 3.2-2: Long-term (operational) localized impacts resulting from freeway operations under the Plan would be reduced compared to today but would likely continue to exceed the project specific locally acceptable cancer risk threshold of one in one million. The cumulative impact is beneficial. The continuation of a pre-existing problem is not an impact of the plan or cumulative development.	Same mitigation measures as Impact 3.2-1.	Although toxic air contaminant concentrations at sensitive receptors located closest to regional freeways would remain above acceptable levels they would be significantly reduced compared to today, therefore the impact of the 2008 RTP and cumulative development would be **less than significant**.	LTS	LTS	LTS
Impact 3.2-3: Emissions of short-term criteria pollutants would increase under the Plan as a result of construction of Plan projects and associated development in the region.	Mitigation measures include the mitigation measures included in Impact 3.2-1. Also, compliance with AQMD Rule 403 (Fugitive Dust) will reduce emissions of fugitive dust from construction activities. In addition, the following air quality mitigation measures sets forth a program of air pollution control strategies designed to reduce the project's air quality impacts from construction activities. ***Land Clearing/Earth-Moving:*** **MM–AQ.3:** Apply water or dust suppressants to exposed earth surfaces to control emissions. **MM-AQ.4:** All excavating and grading activities shall cease during second	After implementation of all feasible mitigation measures and incorporation of project features as described above, activities related to construction of RTP Plan projects, as well as associated regional growth would exceed	S-	S=	S=

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	stage smog alerts and periods of high winds. **MM-AQ.5:** All trucks hauling dirt, sand, soil, or other loose materials off-site shall be covered or wetted or shall maintain at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer). ***Paved Surfaces:*** **MM-AQ.6:** All construction roads that have high traffic volumes, shall be surfaced with base material or decomposed granite, or shall be paved or otherwise be stabilized. **MM-AQ.7:** Public streets shall 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-AQ.8:** Construction equipment shall be visually inspected prior to leaving the site and loose dirt shall be washed off with wheel washers as necessary. ***Unpaved Surfaces:*** **MM-AQ.9:** Water or non-toxic soil stabilizers shall be applied as needed to reduce off-site transport of fugitive dust from all unpaved staging areas and other unpaved surfaces. **MM-AQ.10:** Traffic speeds on all unpaved surfaces shall not exceed 25 mph. ***Other Construction Mitigation Measures*** **MM-AQ.11:** Low sulfur or other alternative fuels shall be used in construction equipment where feasible. **MM-AQ.12:** Deliveries related to construction activities that affect traffic flow shall 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 shall be provided to improve traffic flow (e.g., flag person). **MM-AQ.13:** To the extent possible, construction activity shall utilize electricity from power poles rather than temporary diesel power generators and/or gasoline power generators. **MM-AQ.14:** Revegetate exposed earth surfaces following construction.	emission thresholds for regional NOx, CO, PM10, SO2, and ROG. Therefore, construction of the 2008 RTP projects and associated growth would have a **significant** and unavoidable impact on regional air quality.			
Cumulative Impact 3.2-4: Cumulative development would result in on-road emissions discussed in previous impacts as well as train, airplane, ship and stationary and area sources of emissions. All emissions are anticipated to be consistent with	Mitigation measures for Impact 3.2-1 would also address this imapact.	After implementation of all feasible mitigation measures the region is anticipated to be	LTS	LTS	LTS

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applicable AQMPs and SIPs and within regional conformity emission budgets. Thus, consistency with applicable plans would be a **less than significant** impact. Nonetheless, such cumulative increases in emissions would be **significant**.		able to meet applicable conformity budgets. Thus the impact of consistency with applicable plans would be **less than significant**. Nonetheless, the level of increase in emissions anticipated for the region is considered to be **cumulatively significant** for all pollutants except NOx.	S=	S=	S=
Impact 3.2-5: The 2008 RTP would result in increased trips and VMT as well as increased growth in the region compared to today, resulting in increases in Greenhouse Gas (GHG) emissions.	GHG emissions are generally associated with the combustion of fossil fuel to power motor vehicles and provide energy. As such, the most effective way to reduce GHG emissions is to reduce energy use and associated fossil fuel combustion. The RTP PEIR Energy Section provides a comprehensive list of mitigation measures that would reduce fossil fuel combustion in the SCAG region. Additional measures are as follows: **MM-AQ.15:** Project sponsors should, where feasible, implement policies for sustainable airport development, management and airfield design to reduce air pollution and GHG emissions from operations, including cargo operations, ground support and access to and from airports (see Los Angeles World Airports Sustainability Vision and Principles and the Green LA Action Plan). **MM.AQ-16:** Project sponsors should, where feasible, implement a green construction policy that could include: • Ensuring that all off-road construction vehicles should be alternative fuel vehicles, or diesel powered vehicles with Tier 3 or better engines or retrofitted/repowered -to meet equivalent emissions standards as Tier 3 engines; • Using the minimum feasible amount of GHG emitting construction materials; • Using cement blended with the maximum feasible amount of flyash or other materials that reduce GHG emissions	The degree to which the proposed energy mitigation measures will be implemented is difficult to estimate. Improvements in air pollutant emission standards and increased use of alternative fuels would reduce GHG emissions. However, it is unlikely that mitigation measures would reduce GHG emissions below existing conditions (let alone to 1990 levels as required by AB 32) due to anticipated population growth. As such, the RTP	S+	S=	S-

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	• Using asphalt with light colored additives and chemical additives that increase reflectivity and therefore reduce contribution to the heat island effect • Requiring recycling of construction debris to maximum extent feasible • Incorporating planting of shade trees into construction projects where feasible **MM.AQ-17:** Local governments should set specific limits on idling time for commercial vehicles, including delivery and construction vehicles.	would result in a **significant** and unavoidable global warming impact.			
3.3 <u>Biological Resources</u>					
Impact 3.3-1: Transportation projects included in the 2008 RTP on previously undisturbed land could displace natural vegetation, and thus habitat, some of which is utilized by sensitive species in the SCAG region.	**MM-BIO.1:** Each transportation project shall assess displacement of habitat due to removal of native vegetation during route planning. Routes shall be planned in order to avoid and/or minimize removal of native vegetation. **MM-BIO.2:** When avoidance of native vegetation removal is not possible, each transportation project shall 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). **MM-BIO.3:** Individual transportation projects shall include offsite habitat enhancement or restoration to compensate for unavoidable habitat losses from the project site. **MM-BIO-4:** Pre-construction special status species surveys shall be conducted by a qualified biologist to verify presence or absence of species at risk. Species surveys 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 shall be avoided during construction to the extent feasible. **MM-BIO.5:** A Worker Awareness Program (environmental education) shall be developed and implemented to inform project workers of their responsibilities in regards to avoiding and minimizing impacts on sensitive biological resources. **MM-BIO.6:** An Environmental Inspector shall be appointed 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.7:** A qualified wetland scientist shall review construction drawings	Although many measures can be employed to minimize the impacts to habitat due to vegetation removal, for a regional plan of this scale, the impact remains **significant.**	S-	S-	S=

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	as part of each project-specific environmental analysis to determine whether wetlands will be impacted, and if necessary perfor a formal wetland delineation. Appropriate state and federal permits shall 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.8: 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 shall be restored and augmented, if impacts are temporary, at a 1.1: 1 ratio (compensation acres to impacted acres). Permanent impacts shall be compensated for by creating or restoring habitats at a 3:1 ratio as close as possible to the site of the impact.				
	MM-BIO.9: When work is conducted in identified sensitive habitat areas and/or areas of intact native vegetation, construction protocols shall require the salvage of perennial plants and the salvage and stockpile of topsoil (the surface material from 6 to 12 inches deep) and shall be used in restoring native vegetation to all areas of temporary disturbance within the project area.				
	MM-BIO.10: If specific project area trees are designated as "Landmark Trees" or "Heritage Trees", then approval for removals shall be obtained through the appropriate entity, and appropriate mitigation measures shall be developed at that time, to ensure that the trees are replaced. Due to the close proximity of these areas to sensitive wildlife habitats, all mitigation trees will use only locally-collected native species.				
	MM-BIO.11: Suitable habitat for listed vernal pool crustaceans shall be avoided to the extent feasible. If infeasible, impacts shall be mitigated in accordance with the Programmatic Biological Opinion (PBO) for vernal pool invertebrates, issued by the USFWS Sacramento Field Office in 1995. Surveys shall 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.				
	Mitigation for occupied habitat impacted is likely to be compensatory off-site acquisition or protection of similar habitats				

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	at a ratio of 3:1 (compensation acres to that impacted) or other similar ratio with the approval of the USFWS. **MM-BIO.12:** Projects within the range and within suitable habitat for the arroyo toad shall conduct surveys, with USFWS approval, in accordance with 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: 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.13:** Projects within the range and within suitable habitat for the blunt-nosed leopard lizard shall 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 shall occur as this is a CDFG fully protected species with no regulatory mechanism to authorize direct taking (killing) of individuals. **MM-BIO.14:** Projects within the range and within suitable habitat for the California red-legged frog shall 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 shall 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 shall				

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	contact USFWS to determine whether relocating any life stages is appropriate; • The USFWS-approved biologist shall 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 shall be limited to the minimum necessary to achieve the project goal; • If work sites require dewatering, the intakes shall be screened with a maximum mesh sizes of 5 millimeters; • The USFWS-approved biologist shall 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.15:** Projects within the range and within suitable habitat for the California tiger salamander shall 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 shall be implemented to further minimize adverse effects to the California tiger salamander. • A pre-construction survey shall 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 shall be temporarily fenced and avoided. • At locations where upland aestivation habitat is identified and cannot be avoided, aestivation burrows shall 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 shall be present during all new site disturbance				

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	construction activities (vegetation removal, clearing, grubbing, grading) at locations with suitable upland aestivation habitat. • Impacts on breeding ponds shall be avoided until the ponds have dried. • Upon approval by the USFWS, preconstruction surveys to salvage and relocate individual California tiger salamanders shall include installation of drift fences and pitfall traps within construction sites to identify and relocate animals. Following removal of individuals, construction areas shall be fenced with temporary exclusionary silt fencing. • Temporary impacts on upland aestivation habitat shall 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.16:** Projects within the range and within suitable habitat for the Coachella Valley fringe-toed lizard shall 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.17:** Projects within the range and within suitable habitat for the desert tortoise shall 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				

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	project impact areas shall be required to salvage and relocate individual desert tortoise out of harms. Following removal of individuals, construction areas shall 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.18:** 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. Projects within the range and within suitable habitat for the two-striped garter snake shall conduct surveys in accordance with the best professional judgment of a qualified biologist. Preconstruction surveys of project impact areas shall be required to salvage and relocate individual two-striped garter snakes out of harms. Following removal of individuals, construction areas shall be fenced with temporary exclusionary silt fencing. **MM-BIO.19:** To avoid disrupting nesting Swainson's hawks, construction activities at known nesting locations shall 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 shall 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.20:** No more than two weeks before construction in any given milepost, a survey for burrows and burrowing owls shall 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 (1993) which includes up to four surveys on				

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	different dates if there are suitable burrows present. If occupied burrowing owl dens are found within the survey area, a determination shall 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 shall 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 shall 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 shall 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. **MM-BIO.21:** When working within 100 feet of salt or brackish marshland presence for the California black rail, California clapper rail, and Yuma clapper rail shall be assumed for either species during the period February 1- August 31 and construction shall be scheduled to begin no earlier than September 1 and end no later than January 31 to avoid potential impact on reproduction. **MM-BIO.22:** Projects within the range and within suitable habitat for the coastal California gnatcatcher shall 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.				

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	If the species is determined present then the following applies: To avoid disrupting nesting coastal California gnatcatchers, construction activities at known nesting locations shall 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 shall 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.23: Projects within the range and within suitable habitat for the least Bell's vireo shall 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 shall 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 shall 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				

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		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.24:	Projects within the range and within suitable habitat for the southwestern willow flycatcher shall 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 shall 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 shall 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-25:	Trees with unoccupied raptor nests (large stick nests or cavities) shall only be removed prior to March 1, or following				

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		the nesting season. A survey to identify active raptor nests shall be conducted by a qualified biologist no more than two weeks before the start of construction at project sites from March 1 through July 30. Active raptor nests shall be located within 500 feet of the project to the extent feasible and assuming available authorized access. • If an active raptor nest is found within 500 feet of the project a determination shall 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 shall be delayed within 300 feet of such a nest, or as determined by CDFG, 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.				
Impact 3.3-2: The 2008 RTP would potentially contribute to the fragmentation of existing habitat, decreasing habitat patch sizes, reducing habitat connectivity, and causing direct injury to wildlife. The 2008 RTP includes new transportation corridors that may form barriers to animal migration or foraging routes.	**MM BIO-26:**	Individual transportation projects included in the 2008 RTP shall conduct site-specific analyses of opportunities to preserve or improve habitat linkages with areas on and off-site. Mitigation banking (opportunities to purchase, maintain, and/or restore offsite habitat) is one opportunity that project proponents and jurisdictions may pursue.	Route planning to minimize habitat fragmentation impacts, wildlife crossings, on- and off-site habitat restoration and linkages would all reduce the impacts of habitat fragmentation, isolation, and direct injury to wildlife due to transportation projects. For some species, implementation of mitigation measures could also increase the degree of habitat fragmentation. At a	S-	S=	S=
	MM BIO-27:	Each transportation project shall provide wildlife crossings/access at locations useful and appropriate for the species of concern.				
	MM BIO-28:	Individual transportation projects shall include analysis of wildlife corridors during project planning. Impacts to these corridors shall be avoided and/or minimized.				
	MM BIO-29:	Each transportation project included in the Plan shall use wildlife fencing where appropriate to minimize the probability of wildlife injury due to direct interaction between wildlife and roads. Inclusion of this mitigation measure shall 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.				

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		regional scale, the fragmentation of habitat due to the large scale of the 2008 RTP would not be fully avoided or mitigated. The impact would remain **significant**.			
Impact 3.3-3: The 2008 RTP includes new transportation facilities that could increase near-road human disturbances such as litter, trampling, light pollution and road noise in previously relatively inaccessible and undisturbed natural areas.	**MM BIO-30:** Individual transportation projects shall minimize vehicular accessibility to areas beyond the actual transportation surface. This can be accomplished through fencing and signage. **MM BIO-31:** Each project shall establish litter control programs in appropriate areas, such as trash receptacles at road turnouts and viewpoints. **MM BIO-32:** Each project shall use road noise minimization methods, such as brush and tree planting, at heavy noise-producing transportation areas that might affect wildlife. Native vegetation should be used.	In many cases, the mitigation measures outlined above would avoid or minimize impacts to wildlife. However, at the regional scale, additional transportation projects would increase wildlife disturbance and the impact would remain **significant.**	S-	S=	S=
Impact 3.3-4: The 2008 RTP projects would potentially damage natural vegetation and other habitat components as a result of trampling or off-road machinery during the construction phases for these projects. Direct fatalities to wildlife would also potentially occur.	**MM BIO-33:** Each project shall be preceded by pre-construction monitoring to ensure no sensitive species' habitat would be unnecessarily destroyed (also see **BIO-4** through **BIO-10**). All discovered sensitive species habitat shall be avoided where feasible, or disturbance shall be minimized. **MM BIO-34:** Each project shall schedule work to avoid critical life stages (e.g. nesting) of species of concern. **MM BIO-35:** Each project shall fence and/or mark sensitive habitat to prevent unnecessary machinery or foot traffic during construction activities. **MM BIO-36:** When removal and/or damage to sensitive species habitat are unavoidable during construction, each project shall replant any disturbed natural areas with appropriate native vegetation following the completion of construction activities. In the case of permanent losses to sensitive species habitat, mitigation shall also follow the offsite habitat compensation guidance (also see **BIO-4** through **BIO-25**)	Full implementation of each of these mitigation measures would avoid and/or minimize the construction impacts to **less than significant** levels.	LTS	LTS	LTS

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Impact 3.3-5: The 2008 RTP projects would potentially create noise, smoke, lights and/or other disturbances to biological resources during construction phases for these projects.	**MM BIO-37:** Individual projects shall avoid and/or minimize construction activities that have the potential to expose species to noise, smoke, or other disturbances. Pre-construction surveys shall be conducted as appropriate to determine the presence of any species that would need to be protected from such an impact (see **BIO-4** through **BIO-10**). **MM BIO-38:** Individual projects shall be scheduled to avoid construction during critical life stages or sensitive seasons (e.g. the nesting season; see **BIO-25**, and **BIO-11** through **BIO-24**).	Avoidance and minimization of impacts would not reduce this impact to less than significant. The impact remains **significant**.	S-	S=	S=
Impact 3.3-6: The 2008 RTP includes projects that would potentially displace riparian or wetland habitat.	**MM BIO-39:** Construction through or adjacent to wetlands or riparian areas shall be avoided where feasible through route-planning. **MM BIO-40:** Each transportation project shall avoid removal of wetland or riparian vegetation. Specific vegetation that is not to be removed shall be so marked during construction. Riparian vegetation removal shall be minimized. **MM BIO-41:** Each transportation project shall 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. **MM BIO-42:** When individual projects include unavoidable losses of riparian or aquatic habitat, adjacent or nearby riparian or aquatic habitat shall be enhanced (e.g. through removal of non-native invasive wetland species and replacement with more ecologically valuable native species).	The impact to wetlands and riparian areas would remain **significant**.	S-	S=	S=
Impact 3.3-7: The 2008 RTP would potentially increase siltation of streams and other water resources from exposures of erodible soils during construction activities.	**MM BIO-43:** Individual projects near water resources shall 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. A more detailed description of BMPs is provided in Section 3.12 Water Resources. **MM BIO-44:** Individual projects shall 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.	Full implementation of each of these mitigation measures would not avoid the siltation impacts. The impact remains **significant**.	S-	S=	S=
Impact 3.3-8: Implementation of the 2008 RTP would not conflict with any provisions of an adopted Habitat Conservation Plan, or Natural Community Conservation Plan (NCCP).	The 2008 RTP is not in conflict with any adopted Habitat Conservation Plan or Natural Communities Conservation Plan. No mitigation measures are necessary.	The impact is **less than significant**.	LTS	LTS	LTS

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Cumulative Impacts 3.3-9: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization.	The cumulative impacts to biological resources, due to the forecasted urban development associated with the 2008 RTP, would be mitigated using the same measures detailed for Impacts 3.3-1 through 3.3-8, in addition to the following measure. **MM BIO-45:** 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 USFWS and CDFG.	The impacts to biological resources due to regional growth would be reduced through application of the mitigation measures; however, the 2008 RTP's accommodation of approximately 6 million people in the SCAG region by 2035 would contribute to cumulative impacts. Implementation of the 2008 RTP would have a cumulatively considerable contribution to urbanization, and, thus, the impact would remain **significant**.	S+	S+	S-
3.4 <u>Cultural Resources</u>					
Impact 3.4-1: Construction of projects from the 2008 RTP could cause a substantial adverse change in the significance of a historical resource.	**MM-CUL.1:** As part of the appropriate environmental review of individual projects, the project implementation agencies shall identify potential impacts to historic resources. A record search at the appropriate Information Center shall be conducted to determine whether the project area has been previously surveyed and whether historic resources were identified. **MM-CUL.2:** If indicated as necessary by a records search, prior to construction activities, project implementation agencies shall obtain a qualified architectural historian to conduct historic architectural surveys as recommended by the Archaeological 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 cultural	Due to the size and potentially large number of historic properties listed that could be disturbed as a result of the RTP projects, impacts to historic resources would remain **significant**.	S-	S=	S=

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	resources within 1,000 feet of the improvement. **MM-CUL.3:** The project implementation agencies shall comply with Section 106 of the NHPA if 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. This mitigation measure may include, but are not limited to the following: • The project implementation agencies shall carry out the maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation or reconstruction of any impacted historic resource, which shall be conducted in a manner consistent with the Secretary of the Interior's Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings. **MM-CUL.3:** Where feasible, the project implementation agencies shall employ design measures to avoid historical resource areas. **MM-CUL.3:** Where feasible, noise buffers/walls and/or visual buffers/landscaping or some other material shall be constructed to preserve the contextual setting of significant built resources. In some instances, the following mitigation measure may be appropriate in lieu of the previous mitigation measure: **MM-CUL.4:** The project implementation agencies shall 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 significance.				
Impact 3.4-2: Construction of projects from the 2008 RTP could cause a substantial adverse change in the significance of an archaeological resource.	**MM-CUL.5:** As part of the appropriate environmental review of individual projects, the project implementation agencies shall consult with the 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-CUL.6:** Prior to construction activities, the project implementation agencies shall 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	Due to the size and potentially large number of archaeological sites that could be disturbed as a result of the combined projects, impacts to archaeological resources would	S-	S=	S=

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		resources were identified.	remain **significant.**			
	MM-CUL.7:	As necessary prior to construction activities, the project implementation agencies shall 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 cultural resources.				
	MM-CUL.8:	If the record search indicates that the project is located in an area rich with cultural materials, the project proponent shall 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-CUL.9:	Construction activities and excavation 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. The project implementation agencies 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-CUL.10:	Project implementation agencies shall stop construction activities and excavation in the area where cultural resources are found until a qualified archaeologist can determine the importance of these resources.				
Impact 3.4-3: Construction of projects from the 2008 RTP could directly or indirectly destroy unique paleontological resources or sites or unique geological features.	**MM-CUL.11:**	As part of the appropriate environmental review of individual projects, the project implementation agencies shall obtain a qualified paleontologist to identify and evaluate paleontological resources where potential impacts are considered high; the paleontologist shall also conduct a field survey in these areas.	Due to the large number of paleontological localities and unique geologic features found throughout the SCAG region that could be disturbed as a result of the 2008 RTP, impacts to paleontological	S-	S=	S=
	MM-CUL.12:	Construction activities shall 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-CUL.13:	When a construction activity could significantly disturb soils or geologic formations in areas identified as having a moderate to				

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	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 shall be retained (or required to be retained) by the project implementing agency 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 monitor shall 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 shall 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-CUL.14:** Where practicable, routes and project designs that would permanently alter unique geologic features shall be avoided.	resources would remain **significant**.			
Impact 3.4-4: Construction of projects from the 2008 RTP could disturb human remains, including those interred outside of formal cemeteries.	**MM-CUL.15:** As part of environmental review of individual projects, project implementation agencies, 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, shall 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; and **MM-CUL.16:** If the remains are of Native American origin: • The coroner will contact the Native American Heritage	The excavation and construction that may be necessary for some projects in the 2008 RTP 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	S-	S=	S=

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	Commission in order to ascertain the proper descendants from the deceased individual. The coroner shall 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 was unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the commission, in which case
	• The landowner or his authorized representative shall 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 NAHC is unable to identify a descendent;
	  • The descendant identified fails to make a recommendation; or
	  • The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the NAHC Commission fails to provide measures acceptable to the landowner.
		would remain **significant**.			

Cumulative Impacts 3.4-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional impacts to existing historic resources and previously undisturbed and undiscovered cultural resources, as described in Impacts 3.4-1 through 3.4-4 above. This impact would be cumulatively considerable.	The cumulative impacts to cultural resources, due to the forecasted urban development associated with the 2008 RTP, would be mitigated using the same measures detailed for Impacts 3.4-1 through 3.4-4, in addition to the following measure. **MM-CUL.17:** Future impacts to cultural resources shall be minimized through cooperation, information sharing, and SCAG's ongoing regional planning efforts. Resource agencies, such as the Office of Historic Preservation, shall be consulted during this process.	The impacts to cultural resources due to regional scale growth would be reduced through application of the mitigation measures, however the 2008 RTP's accommodation of approximately 5.14 million people to the SCAG region	S+	S+	S-

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		by 2035 would contribute to cumulative impacts. Impacts to cultural and paleontological resources from the 2008 RTP would be **cumulatively considerable**.			
3.5 <u>Energy</u>					
Impact 3.5-1: The implementation of the 2008 RTP is likely to use electricity, natural gas, gasoline, diesel, and other non-renewable energy types in the construction and expansion of the regional transportation system and development in the region between the current conditions and 2035.	**MM-EN.1:** In reviewing projects, lead and implementing agencies shall consider energy implications of construction processes. In general the most energy efficient construction process and long-term operational design shall be selected unless there's an overriding reason why not.	Given the large amount of construction anticipated for the region, the energy that would be consumed by construction is anticipated to be **significant**.	S-	S=	S-
Impact 3.5-2: The implementation of the 2008 RTP is likely to substantially increase the consumption of electricity, natural gas, gasoline, diesel, and other non-renewable energy in the operation of the transportation system and operation of associated growth in the region between the current conditions and 2035.	In addition to the mitigation measures specified below, mitigation measures identified in the Transportation Section for the impacts of transportation system usage would serve to mitigate the impacts of growing transportation energy demand. **Mitigation Measures for State and Federal Government** **MM-EN.2:** State and federal lawmakers and regulatory agencies should pursue the design of programs to either require or incentivize the expanded availability and use of alternative-fuel vehicles to reduce the impact of shifts in petroleum fuel supply and price. **Mitigation Measures for SCAG** **MM-EN.3:** SCAG shall continue to consider energy uncertainty impacts prior to the development of the next Regional Transportation Plan. Topics that should 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	The regional increase in transportation-related energy demand as a result of implementing the 2008 RTP would remain a **significant** impact, even with the above mitigation.	S-	S=	S-

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	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. This work will help SCAG better understand the relationship between transportation, land use and energy uncertainty. **MM-EN.4:** 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-EN.5:** SCAG shall encourage clean post recycle conversion technologies to produce energy or technologies that offset energy use or air emissions. **MM-EN.6:** 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-EN.7:** 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-EN.8:** SCAG shall encourage the Federal Government to increase the Corporate Average Fuel Economy (CAFE) to a level that will reduce our dependence on petroleum and reduce greenhouse gas emissions. **MM-EN-9:** 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-EN-10:** SCAG shall continue to develop, in coordination with the California Air Resourcs 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-EN.11:** SCAG shall continue to work with local jurisdictions and energy providers, through its Energy and Environment Committee and 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. **MM-EN.12:** SCAG shall continue to develop, in coordination with the				

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	California Air Resources Board, a data and information collection and analysis system that provides an understanding of the energy demand and greenhouse gas emissions in the SCAG Region. **Mitigation Measures for Local Agencies** **MM-EN.13:** Local agencies 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-EN.14:** Local agencies 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 should be developed and monitored. SCAG recommends the use of Appendix F, Energy Conservation, of the *CEQA Guidelines.*				

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	MM-EN.15: Local agencies should streamline permitting and provide public information to facilitate accelerated construction of solar and wind power. **MM-EN.16:** Local agencies should adopt a "Green Building Program" to promote green building standards. Green buildings can reduce local environmental impacts, regional air pollutant emissions and global greenhouse gas emissions. Green building standards involve everything from energy efficiency, usage of renewable resources and reduced waste generation and water usage. For example, water-related energy use consumes 19 percent of the state's electricity. The residential sector accounts for 48 percent of both the electricity and natural gas consumption associated with urban water use. While interest in green buildings has been growing for some time, cost has been a main consideration as it may cost more up front to provide energy-efficient building components and systems. Initial costs can be a hurdle even when the installed systems will save money over the life of the building. Energy efficiency measures can reduce initial costs, for example, by reducing the need for over-sized air conditioners to keep buildings comfortable. Undertaking a more comprehensive design approach to building sustainability can also save initial costs through reuse of building materials and other means. A comprehensive study of the value of green building savings is the 2003 report to California's Sustainable Building Task Force. In the words of the report: "While the environmental and human health benefits of green building have been widely recognized, this comprehensive report confirms that minimal increases in upfront costs of about 2% to support green design would, on average, result in life cycle savings of 20% of total construction costs -- more than ten times the initial investment. For example, an initial upfront investment of up to $100,000 to incorporate green building features into a $5 million project would result in a savings of $1 million in today's dollars over the life of the building." **MM-EN.17:** Local governments should alter zoning to improve jobs/housing balance and creating communities where people live closer to work, bike, walk, and take transit as a substitute for personal auto travel. Creating walkable, transit oriented nodes would generally reduce energy use and greenhouse gas emissions. Residential energy use (electricity and natural gas) accounts for 14 percent of California's greenhouse gas emissions. It is estimated that households in transit-oriented developments drive 45 percent less than residents in auto-dependent neighborhoods. In addition, mixed land uses (i.e., residential developments near work places, restaurants, and shopping				

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	centers) with access to public transportation have been shown to save consumers up to 512 gallons of gasoline per year.. Furthermore, studies have shown that the type of housing (such as multi-family) and the size of a house have strong relationships to residential energy use. Residents of single-family detached housing consume over 20 percent more primary energy than those of multifamily housing and 9 percent more than those of single-family attached housing. **Mitigation Measures for Utilities** **MM-EN.18:** Utilities should install and maintain California Best Available Control Technologies on all power plants at the US-Mexico border. **MM-EN.19:** Utilities should consider increasing capacity of existing transmission lines, where feasible. **Mitigation Measures for Project Implementing Agencies/Developers** **MM-EN.20:** Project sponsors should support programs to reduce single occupancy vehicle trips such as telecommuting, ridesharing, alternative work schedules, and parking cash-outs. **MM-EN.21:** Project sponsors should support only the use of the best available technology including monitoring air and water impacts for locating any nuclear waste facility. **MM-EN.22:** Project sponsors 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 shall be completed according to the specifications of the energy provider. **MM-EN.23:** Project sponsors should consider the most cost-effective alternative and renewable energy generation facilities. **MM-EN.24:** Project sponsors should ensure that new buildings incorporate solar panels in roofing and tap other renewable energy sources to offset new demand on conventional power sources. **MM-EN.25:** Project sponsors should require energy efficient design for buildings. This may include strengthening local building codes for new construction and renovation to require a higher level of energy efficiency. **MM-EN.26:** Project sponsors should fund and schedule energy efficiency "tune-ups" of existing buildings by checking, repairing, and readjusting heating, ventilation, air conditioning, lighting, hot water equipment, insulation and weatherization. (Facilitating or				

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		funding the improvement of energy efficiency in existing buildings could offset in part the global warming impacts of new development.)				
	MM-EN.27:	Project sponsors should provide individualized energy management services for large energy users.				
	MM-EN.28:	Project sponsors should require the use of energy efficient appliances and office equipment.				
	MM-EN.29:	Project sponsors should pursue incentives and technical assistance for lighting efficiency.				
	MM-EN.30:	Project sponsors 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-EN.31:	Project sponsors 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-EN.32:	Project sponsors should incorporate on-site renewable energy production (through, e.g., participation in the California Energy Commission's New Solar Homes Partnership). Require project proponents to install solar panels, water reuse systems, and/or other systems to capture energy sources that would otherwise be wasted.				
	MM-EN.33:	Project sponsors should pursue incentives to encourage the use of energy efficient equipment and vehicles.				
	MM-EN.34:	Project sponsors should provide public education and publicity about energy efficiency programs and incentives.				
	MM-EN.35:	In some instances, a project sponsor may find that measures that will directly reduce a project's greenhouse gas emissions are insufficient. A lead agency may consider whether carbon offsets would be appropriate. The project proponent 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 should ensure that any mitigation taking the form of carbon offsets is specifically identified and that such mitigation will in fact occur.				
	MM-EN.36:	Project sponsors should incorporate and local governments should include the following land use principles that use resources efficiently, eliminate pollution and significantly reduce waste into their projects, zoning codes and other				

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	implementation mechanisms: • 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-EN.37:** Project sponsors and local governments should integrate 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, Energy Star Homes, Green Point Rated Homes, and the California Green Builder Program. Energy saving measures that should be explored 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=Products.pr_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 (3)				

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Impact 3.5-3: Implementation of the 2008 RTP has the potential to not fully address the greenhouse gas reduction levels identified in AB 32 (1990 levels by 2020).	See Mitigation Measures under Impact 3.5-2.	The impact is **significant** even after mitigation.	S=	S-	S-
Cumulative Impact 3.5-4: Implementation of the investments and policies in the 2008 RTP would contribute to a cumulatively considerable increase in the amount of total energy consumed in the SCAG region between 2008 and 2035.	The cumulative impacts to biological resources, due to the forecasted urban development associated with the 2008 RTP, would be mitigated using the same measures detailed for Impacts 3.5-1 through 3.5-3 in addition to the following measure. **MM BIO-45:** 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 U.S. Fish and Wildlife Service and California Department of Fish and Game during this update process.	Even with mitigation, this cumulative impact would remain **significant**.	S=	S=	S-
3.6 <u>Geology, Soils and Seismicity</u>					
Impact 3.6-1: Implementation of the 2008 RTP could expose people or structures to potential substantial adverse effects, risk of surface rupture, ground shaking, liquefaction and landsliding or seismically-induced ground shaking or seiche waves.	**MM GEO-1:** Implementing agencies shall ensure that projects are designed in accordance with county and city code requirements for seismic ground shaking. The design of projects shall 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 GEO-2:** Implementing agencies shall 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 GEO-3:** The project implementing agencies shall ensure that geotechnical analyses from qualified geotechnical experts are conducted within construction areas 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.	Although projects can employ siting and design standards which consider seismically active areas and Alquist-Priolo fault zones, due to the regional scale of the Plan, the impact remains **significant**.	S-	S=	S=

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Impact 3.6-2: Significant earthwork associated with implementation of the 2008 RTP could result in substantial soil erosion and/or the loss of topsoil in some cases potentially resulting in slope failure.	**MM GEO-4:** The project implementing agencies shall ensure that project designs provide adequate slope drainage and appropriate landscaping to minimize the occurrence of slope instability and erosion. Design features shall include measures to reduce erosion caused by stormwater. Road cuts shall be designed to maximize the potential for revegetation. **MM GEO-5:** Implementing agencies shall ensure that projects avoid landslide areas and potentially unstable slopes wherever feasible. **MM GEO-6:** The project implementing agencies shall ensure that site-specific geotechnical investigations conducted by a qualified geotechnical expert shall 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.	Given the topography, ecology and meteorology of the SCAG region and the regional scale of the project, the impact will remain **significant**.	S-	S=	S=
Impact 3.6-3: Projects included in the 2008 RTP could be located on expansive soils, a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.	**MM GEO-7:** The project implementing agencies shall ensure that site-specific geotechnical investigations conducted by a qualified geotechnical expert shall 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, shall be implemented in project designs. **MM GEO-8:** Implementing agencies shall 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 GEO-9:** Implementing agencies shall ensure that, prior to preparing project designs, new and abandoned wells are identified within construction areas to ensure the stability of nearby soils.	Given the underlying geologic features of the SCAG region and the regional scale of the project, the impact will remain **significant**.	S-	S=	S=
Cumulative Impact 3.6-4: Urbanization in the SCAG region would increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. Implementation of the 2008 RTP would have the potential to result in a cumulatively considerable adverse effect on human beings and property when considered at the regional scale.	Mitigation measures MM.GEO-1 through MM.GEO-9 would be applied to this impact in addition to the following measure: **MM GEO-10:** Future impacts to geological resources shall be minimized through cooperation, information sharing, and program development as part of SCAG's regional planning efforts. Resource agencies, such as the USGS, shall be consulted during this update process.	The impacts to geological resources due to regional scale growth would be reduced through application of the mitigation measures, however the 2008 RTP's accommodation of	S=	S=	S-

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		an additional 5.14 million more people in the SCAG region by 2035 would contribute to **cumulative significant** impacts.			
3.7 Hazardous Materials					
Impact 3.7-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	**MM-HM.1:** The project implementation agency shall 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.	The mitigation measure would assure appropriate steps taken to minimize any hazard to the public or the environment. The impact after mitigation would be **less than significant**.	LTS	LTS	LTS
Impact 3.7-2: The implementation of the 2008 RTP could 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-HM.2:** SCAG shall encourage the USDOT, the Office of Emergency Services, and Caltrans to continue to conduct driver safety training programs and encourage the private sector to continue conducting driver safety training. **MM-HM.3:** SCAG shall encourage the USDOT and the CHP to continue to enforce speed limits and existing regulations governing goods movement and hazardous materials transportation.	The improvements to the regional transportation system by 2035 would facilitate a substantial increase in the transportation of all goods, including hazardous materials. However, even with the above mitigation, this impact would remain **significant**.	S-	S+	S=
Impact 3.7-3: The implementation of the 2008 RTP could create a hazard to the public or the environment by emitting hazardous materials within one-quarter mile of a school.	Mitigation measures above to reduce risk of upset would also apply to this impact. **MM-HM.4:** Prior to approval of any RTP project, the Lead Agency for each individual project shall consider existing and known planned school locations when determining the alignment of new transportation projects and modifications to existing transportation facilities.	The improvements to the regional transportation system by 2035 would facilitate a substantial increase in the transportation of all goods, including hazardous	S-	S=	S=

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		materials. Even with the above mitigation, this impact would remain **significant**.			
Impact 3.7-4: The implementation of the 2008 RTP could 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.	**MM-HM.5:** Prior to approval of any RTP project, the project implementation agency shall consult all known databases of contaminated sites and undertake a standard Phase 1 Environmental Site Assessment in the process of planning, environmental clearance, and construction for projects included in the 2008 RTP. If contamination is found the implementing agency shall coordinate clean up and/or maintenance activities. **MM-HM.6:** Where contaminated sites are identified, the project implementation agency shall 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.	The mitigation measure would assure that contaminated properties are identified and appropriate steps taken to minimize human exposure and prevent any further environmental contamination. The impact after mitigation would be **less than significant**.	LTS	LTS	LTS
Cumulative Impact 3.7-5: The 2008 RTP would contribute a cumulatively significant amount of hazardous material transportation impacts to areas outside of the SCAG region.	Mitigation Measures **MM-HM.1 though MM.HM.6** would also address this impact.	Even with the above mitigation, the regional contribution to potential impacts outside the region would remain **significant.**	S+	S+	S-
Cumulative Impact 3.7-6: Implementation of the investments and policies in the 2008 RTP could create a potential hazard to the public or the environment by the disturbance of contaminated sites as a result of population and housing growth in the region.	Mitigation Measures **MM-HM.1 though MM.HM.6** as implemented by local planners and private developers would address this impact.	With appropriate review and clean up or maintenance, this impact would not be cumulatively considerable and therefore would be **less than significant**.	LTS	LTS	LTS

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3.8 <u>Land Use</u>					
Impact 3.8-1: The proposed 2008 RTP contains transportation projects and strategies to distribute the future growth in the region. These projects and strategies could result in inconsistencies with currently applicable adopted local land use plans and policies.	**MM-LU.1:** SCAG shall encourage cities and counties in the region to provide SCAG with electronic versions of their most recent general plan and any updates as they are produced. **MM-LU.2:** 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-LU.3:** 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-LU.4:** Planning is an iterative process and SCAG is a consensus building organization. SCAG shall work with cities and counties to encourage that general plans reflect RTP policies. SCAG will work to build consensus on how to address inconsistencies between general plans and RTP policies. **MM-LU.5:** SCAG shall provide technical assistance and regional leadership to implement the Compass Blueprint growth strategy and integrate growth and land use planning with the existing and planned transportation network. **MM-LU.6:** SCAG shall provide planning services to local governments 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 within 2% Strategy Opportunity Areas • 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-LU.7:** SCAG shall continue with a targeted public relations strategy	It is likely that in some instances, local currently adopted general plans will be inconsistent with RTP policies. This impact would be **significant**.	S-	S=	S+

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	that emphasizes regional leadership, the benefits and implications of Compass Blueprint principles, and builds a sense of common interests among Southern Californians. **MM-LU.8:** SCAG shall expand the role of the Compass Partnership, a forum for convening representatives from government, civic leaders and members of the development community. SCAG shall encourage cooperative land use decision-making and planning efforts between neighboring jurisdictions. **MM-LU.9:** 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-LU.10:** Local governments should provide for new housing consistent with state housing law to accommodate their share of the forecasted regional growth. **MM-LU.11:** Local governments should adopt and implement General Plan Housing Elements that accommodate the housing need identified through the RHNA process. Affordable housing should be provided consistent with the RHNA income category distribution adopted for each jurisdiction. **MM-LU.12:** Local governments should consider shared regional priorities, as outlined in the Compass Blueprint, RTP, and other ongoing regional planning efforts in determining their own development goals and drafting local plans. **MM-LU.13:** Local governments and subregional organizations should develop ordinance and other programs which will enable and assist in the cleanup and redevelopment of brownfield sites. **MM-LU.14:** Local governments and subregional organizations should develop adaptive reuse ordinances and other programs that will enable the conversion of vacant or aging commercial, office and some industrial properties to housing and mixed-use housing.				
Impact 3.8-2: The 2008 RTP contains transportation projects that have the potential to disrupt or divide established communities.	Mitigation measures **MM-LU.1 through MM-LU.14** would be applied to mitigate this impact in addition to the following measures. **MM-LU.15:** As part of the second tier review performed on a project-by-project basis, a study should be completed by the lead agency to determine whether an area is classified as a "cohesive community" as defined by Environmental Handbook Volume 4, Community Impact Assessment (Caltrans 1997). The study should include the method for determining the level of cohesiveness for a given community and identify mitigation	The 2008 RTP proposes projects that have the potential to disrupt or divide communities and, considering the scale and number of these projects, even	S-	S=	S+

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	measures to reduce or avoid significant effects. Specific mitigation measures could include, but are not limited to pedestrian overcrossings, "cut and covers" and development of parks or other social interaction centers. **MM-LU.16:** Significant adverse impacts to community cohesion resulting from the displacement of residences or businesses shall 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-LU.17:** Project implementation agencies shall design new transportation facilities that consider access to existing community facilities, as feasible. During the design phase of the project, community amenities and facilities shall be identified and considered in the design of the project. **MM-LU.18:** Project implementation agencies shall design roadway improvements that minimize barriers to pedestrians and bicyclists, as feasible. During the design phase, pedestrian and bicycle routes shall be determined that permit connections to nearby community facilities.	with mitigation, it is likely that in some cases impacts will not be mitigated to a less than significant level. This impact would be **significant**.			
Cumulative Impact 3.8-3: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to land use and would change the intensity of land use in some areas.	The mitigation measures listed above for Impacts 3.8-1 and 3.8-2 would be applied as mitigation for this impact. In addition, the following measure would apply. **MM LU-19:** SCAG's on-going 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.	In order to accommodate the projected population totals assumed for 2035, the region will need to change land uses and increase the intensity of some existing land use. The cumulative impact would remain **significant**.	S-	S+	S+

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3.9 Noise					
Impact 3.9-1: Grading and construction activities associated with the proposed freeway, arterial, transit and HSRT projects identified in the 2008 RTP would intermittently and temporarily generate noise levels above ambient background levels. Noise levels in the immediate vicinity of the construction sites would increase substantially sometimes for extended duration.	**MM-NO.1:** Project implementing agencies shall comply with all local sound control and noise level rules, regulations, and ordinances. **MM-NO.2:** Project implementing agencies shall limit the hours of construction to between 6:00 a.m. and 8:00 p.m. on Monday through Friday and between 7:00 a.m. and 8:00 p.m. on Saturdays. Construction should not occur on Sundays or Holidays within 3,000 feet of sensitive receptors without specific overriding need being documented. **MM-NO.3:** Equipment and trucks used for project construction shall utilize the best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) in order to minimize construction noise impacts. **MM-NO.4:** Impact equipment (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered wherever possible, to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed air exhaust would 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 where feasible, and this could achieve a reduction of 5 dBA. Quieter procedures will be used, such as the use of drilling rather than impact equipment, whenever feasible. **MM-NO.5:** Project implementing agencies shall ensure that stationary noise sources are located as far from sensitive receptors as possible. If they must be located near existing receptors, they shall be adequately muffled. **MM-NO.6:** The project implementing agencies shall designate a complaint coordinator responsible for responding to noise complaints received during the construction phase. The name and phone number of the complaint coordinator shall be conspicuously posted at construction areas and on all advanced notifications. This person shall be responsible for taking steps required to resolve complaints, including periodic noise monitoring, if necessary. **MM-NO.7:** Noise generated from any rock-crushing or screening operations performed within 3,000 feet of any occupied	The above mitigation measures would reduce noise impacts; however, it is anticipated that construction noise would remain a **significant** impact.	S-	S=	S=

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		residence shall be mitigated by the project proponent by strategic placement of material stockpiles between the operation and the affected dwelling or by other means approved by the local jurisdiction.				
	MM-NO.8:	Project implementing agencies shall direct contractors to implement appropriate additional noise mitigation measures including, but not limited to, changing the location of stationary construction equipment, shutting off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources to comply with local noise control requirements.				
	MM-NO.9:	Project implementing agencies shall 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-NO.10:	In residential areas, pile driving will be limited to daytime working hours. No pile-driving or blasting operations shall be performed within 3,000 feet of an occupied residence on Sundays, legal holidays, or between the hours of 8:00 p.m. and 8:00 a.m. on other days. Any variance from this condition shall be approved by the local jurisdiction only with documentation of overriding need.				
	MM-NO.11:	Wherever possible, sonic or vibratory pile drivers will be used instead of impact pile-drivers (sonic pile drivers are only effective in some soils). If sonic or vibratory pile drivers are not feasible, acoustical enclosures will be provided as necessary to ensure that pile driving noise does not exceed speech interference criterion at the closest sensitive receptor.				
	MM-NO.12:	Engine and pneumatic exhaust controls on pile drivers will be required as necessary to ensure that exhaust noise from pile driver engines is minimized to the extent feasible.				
	MM-NO.13:	Where feasible, pile holes will be pre-drilled to reduce potential noise and vibration impacts.				
Impact 3.9-2: Noise-sensitive land uses could be exposed to noise in excess of normally acceptable noise levels and/or could experience substantial increases in noise 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 transit facilities as well as increased	**MM-NO.14:**	As part of the appropriate environmental review of each project, a project specific noise evaluation shall be conducted and appropriate mitigation identified and implemented.	Although mitigation measures are implemented for the impact, it may not reduce noise levels to below regulatory levels in all circumstances. This	S-	S=	S=
	MM-NO.15:	Project implementation agencies shall 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				

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use of existing transit facilities, etc.).	with adjacent transportation facilities. **MM-NO.16:** Project implementation agencies shall, 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-NO.17:** Project implementation agencies shall 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-NO.18:** Project implementation agencies shall, to the extent feasible and practicable, improve the acoustical insulation of dwelling units where setbacks and sound barriers do not sufficiently reduce noise. **MM-NO.19:** The project implementation agencies shall 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-NO.20:** To reduce noise impacts, maximize distance of the HSRT route alignment from sensitive receptors. If the HSRT guideway is constructed along the center of a freeway, operation 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-NO.21:** Reduce HSRT speed in the vicinity of sensitive receptors. **MM-NO.22:** As a last resort, eliminate the noise-sensitive receptor by acquiring rail and freeway rights-of-way. This would ensure the effective operation of all transportation modes. **MM-NO.23:** Passenger stations, central maintenance facilities, decentralized maintenance facilities, and electric substations should be located away from sensitive receptors.	impact would remain **significant**.			
Cumulative Impact 3.9-3: Cumulative ambient noise levels could increase in urban areas of the region to exceed normally acceptable noise levels or have substantial increases in noise 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,	Mitigation measures intended to reduce the noise impacts on sensitive receptors are part of the 2008 RTP. These include: site design, buffers, soundwalls, etc. Further reduction in noise impacts would be obtained through the implementation of the measures described in **MM-NO.14 through MM-NO.23.**	Mitigation measures **MM-NO.15** through **MM-NO.23** may not reduce noise levels to below regulatory levels in all cases. Therefore, the	S-	S=	S=

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ramps, and new use of new transit facilities as well as increased use of existing transit facilities, etc.).		impact would be **significant.**			
3.10 <u>Open Space</u>					
Impact 3.10-1: Implementation of the proposed 2008 RTP could result in substantial disturbance and/or loss of prime farmlands and/or grazing lands, throughout the six-county SCAG region.	**MM-OS.1:** 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-OS.2:** For projects in agricultural areas, project implementation agencies shall 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 shall be evaluated in project-specific environmental documents. The analysis shall use the land evaluation and site assessment (LESA) analysis method (CEQA Guidelines §21095), as appropriate. The project implementation agencies or local jurisdictions shall 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-OS.3:** 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-OS.4:** Project implementation agencies shall 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.	This impact would remain **significant** because it is anticipated that substantial loss and disturbance of agricultural land would occur.	S-	S=	S=

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IMPACT	MITIGATION MEASURES		2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
	MM-OS.5:	Prior to final approval of each project and when feasible and prudent, the implementing agency shall establish conservation easement programs to mitigate impacts to prime farmland.				
	MM-OS.6:	Prior to final approval of each project, the implementing agency shall 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-OS.7:	Prior to final approval of each project, the implementing agency shall encourage enrollments of agricultural lands for counties that have Williamson Act programs, where applicable.				
	MM.OS-8:	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-OS.9:	SCAG shall use its IGR process to review projects with potentially significant impacts to important farmlands and recommend impact avoidance and mitigation measures.				
	MM-OS.10:	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-OS.11:	Developers and local governments should submit for IGR review projects with potentially significant impacts to important farmlands. Projects should include mitigation measures to reduce impacts and demonstrate project alternatives that avoid or lessen impact to agricultural lands. Mitigation should occur at a 1:1 ratio.				
Impact 3.10-2: Implementation of the projects included in the 2008 RTP would result in a substantial loss or disturbance of existing open space and recreation lands.	**MM-OS.12:**	Project implementation agencies shall ensure that projects are consistent with federal, state, and local plans that preserve open space.	It is anticipated that impacts to agricultural lands would not be able to be mitigated in every instance. Therefore, This impact would remain **significant**.	S+	S+	S-
	MM-OS.13:	Project implementation agencies shall 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-OS.14:	Project implementation agencies shall 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.				

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	MM-OS-15: Prior to final approval of each project, the implementing agency shall 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 implementation agencies or local jurisdiction shall be responsible for ensuring adherence to the mitigation measures prior to construction.				
	MM-OS.16: For projects that require approval or funding by the USDOT, project implementation agencies shall comply with Section 4(f) of the USDOT Act.				
	MM-OS.17: 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-OS.18: SCAG shall establish criteria for evaluating impacts to regionally significant open space resources, and will recommend mitigation measures for significant impacts to regional resources. These recommendations will be included in SCAG's Regional Open Space Guidance.				
	MM-OS.19: SCAG shall develop and implement coordinated mitigation programs for regional projects, with an emphasis on regional transportation projects.				
	MM-OS.20: SCAG shall produce and maintain a list/map of potential conservation opportunity areas. These conservation opportunity areas may be used by local governments and project sponsors as priority areas for mitigating impacts to open space resources. SCAG's forthcoming regional open space guidance document will include additional information on conservation opportunity areas.				
	MM-OS.21: SCAG shall use its IGR process to review projects with potentially significant impacts to open space and recommend impact avoidance and mitigation measures.				
	MM-OS.22: Project sponsors should ensure that transportation systems proposed in the RTP 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-OS.23: Project sponsors 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 growth that				

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	accompanies transportation projects/improvements. **MM-OS.24:** Individual projects submitted for IGR review 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 shall demonstrate consideration of alternatives that would avoid or reduce impacts to open space. **MM-OS.25:** Individual projects 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, and Ventura County Mitigation Guidelines.				
Impact 3.10-3: Implementation of the 2008 RTP could increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facilities would occur; or could result in a decrease in performance objectives for existing parks.	**MM-OS.26:** SCAG, in collaboration with its member agencies, shall work to enhance community open space and its accessibility. **MM-OS.27:** 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-OS.28**: 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-OS.29**: 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. **MM-OS.30:** 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 shall encourage joint use of utility, transportation and other rights-of-way, greenbelts, and biodiversity areas **MM-OS.31:** Local governments should prepare a Needs Assessment to determine the level of adequate community open space level for their areas. **MM-OS.32:** Local governments should encourage patterns of urban development and land use, which reduce costs on infrastructure and make better use of existing facilities.	Even with mitigation, implementation of the 2008 RTP would induce population in areas that are currently underserved by recreational facilities. This impact would remain **significant**.	S+	S+	S-

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IMPACT	MITIGATION MEASURES	2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
Cumulative Impact 3.10-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth patterns contributes to regional cumulatively considerable impacts to open space and result in a loss of open space and agricultural lands in the region.	The Mitigation measures listed above for impacts 3.10-1 through 3.10-3 shall be applied to Tier 2 projects (General and Specific plans and individual development projects) in the region. In addition to these measures, the following mitigation measures would be applied to Tier 2 and 3 projects (General and Specific plans and individual development projects) in the SCAG Region. **MM-OS.33:** SCAG's Compass Blueprint program and other on-going 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-OS.34:** Project level mitigation for significant cumulative and growth-inducing impacts on open space resources will include but not be limited to the conservation of natural lands, community open space and important farmland through existing programs in the region or through multi-party conservation compacts facilitated by SCAG. **MM-OS.35:** Local governments should establish transfer of development rights (TDR) programs to direct growth to less agriculturally valuable lands (while considering the potential effects at the sites receiving the transfer) and ensure the continued protection of the most agriculturally valuable land within each county through the purchase of the development rights for these lands. Local governments should also consider the following: • 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-OS.36:** Local governments 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 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-OS.37:** SCAG shall support local jurisdictions and other service providers in their efforts to develop sustainable communities	In order to accommodate the anticipated growth in the region by 2035, substantial changes in vacant, agricultural and open space lands will occur. The cumulative impact would remain **significant**.	S+	S+	S-

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	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-OS.38: SCAG shall consider consistency with ongoing regional open space planning in funding opportunities and programs administered by SCAG.				
	MM-OS.39: Local governments 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-OS.40: Local governments should encourage patterns of urban development and land use, which reduce costs on infrastructure and make better use of existing facilities. Strategies local governments 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-OS.41: Project sponsors and local governments should increase the accessibility to natural areas lands for outdoor recreation.				
	MM-OS.42: Project sponsors and local governments should promote infill development and redevelopment to revitalize existing communities.				
	MM-OS.43: Project sponsors should incorporate and local governments should include land use principles, such as green building, that use resources efficiently, eliminate pollution and significantly reduce waste into their projects, zoning codes and other implementation mechanisms				
	MM-OS.44: Project sponsors and local governments should promote water-efficient land use and development.				
	MM-OS.45: Project sponsors and local governments 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.				

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3.11 <u>Population, Housing and Employment</u>					
Impact 3.11-1: Implementation of the 2008 RTP could facilitate substantial population growth to some areas of the region.	**MM-POP.1:** SCAG shall work with its member agencies to implement growth strategies to create an urban form designed to utilize the existing transportation networks and the transportation improvements contained in the 2008 RTP, enhancing mobility and reducing land consumption.	The policies included in the Plan seek to direct growth in a way that is efficient for both mobility and land consumption. However, implementation of the Plan would help distribute growth to certain vacant areas of the region. Thus, the impact would remain **significant**.	S-	S=	S=
Impact 3.11-2: Implementation of the 2008 RTP projects could require the acquisition of rights-of-way that could displace a substantial number of existing homes and businesses.	**MM-POP.2:** For projects with the potential to displace homes and/or businesses, project implementation agencies shall 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 shall be minimized to the extent feasible. If possible, existing rights-of-way should be used. **MM-POP.3:** Project implementation agencies shall develop a construction schedule that minimizes potential neighborhood deterioration from protracted waiting periods between right-of-way acquisition and construction.	Not all of the projects in the 2008 RTP will be able to be built in existing rights-of-way. A substantial number of businesses and residences would be displaced through the development of projects in the 2008 RTP. This impact would remain **significant**.	S-	S=	S+
Cumulative Impact 3.11-3: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to currently vacant natural land.	Mitigation measures MM-POP.1 through MM-POP.3 would be applied to mitigate this cumulative impact in addition to the following measure. **MM-POP.4**: 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.	The accessibility afforded by the 2008 RTP, and the expected shifts in population, households, and employment associated with the mobility benefits would change the growth patterns in	S-	S+	S+

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		the region. The impact would remain **significant**.			
3.12 <u>Public Services and Utilities</u>					
Impact 3.12-1: Construction and implementation of the 2008 RTP would affect the level of transportation-related public services facilities, such as police and fire/emergency personnel and associated stations or other public facilities in the SCAG Region.	**MM-PS.1:** Project implementation agencies shall ensure that prior to construction all necessary local and state road and railroad encroachment permits are obtained. The project implementation agency shall 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 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 shall be asked to identify detours for emergency vehicles, which will then	The impact would be **less than significant** with mitigation.	LTS	LTS	LTS

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	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.				
Impact 3.12-2: Construction necessary to implement the 2008 RTP may uncover and potentially sever underground utility lines (electric and natural gas).	**MM-PS.2:** Prior to construction, the project implementation agency shall identify the locations of existing utility lines. The contractor shall avoid all known utility lines during construction.	The impact would be **less than significant** after mitigation.	LTS	LTS	LTS
Impact 3.12-3: Construction necessary to implement the 2008 RTP would affect the demand for solid waste services in the SCAG region.	**MM-PS.3:** Projects identified in the 2008 RTP that require solid waste collection 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 shall be identified in each project's CEQA documentation. **MM-PS.4:** Each of the proposed projects identified in the 2008 RTP shall comply with applicable regulations related to solid waste disposal. **MM-PS.5:** The construction contractor shall work with the respective County's Recycling Coordinator to ensure that source reduction techniques and recycling measures are incorporated into project construction. **MM-PS.6:** The amount of solid waste generated during construction will be estimated prior to construction, and appropriate disposal sites will be identified and utilized. **MM-PS.7:** Project implementation agencies shall 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 would 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	The impact would be **less than significant** after mitigation.	LTS	LTS	LTS

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	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-PS.8:** Project implementation agencies shall 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 should be sited with an adequate landfill-owned, undeveloped land buffer to minimize the potential adverse impacts of the landfill in neighboring communities. **MM-PS.9:** Project implementation agencies shall discourage exporting of locally generated waste outside of the SCAG region. Disposal within the county where the waste originates shall 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 SCAQMP and RTP policies should be required. **MM-PS.10:** Project implementation agencies shall adopt Zero Waste goals and practices and look for opportunities for voluntary actions to exceed the 50% waste diversion target. **MM-PS.11:** Project implementation agencies shall build local markets for waste prevention, reduction, and recycling practices. **MM-PS.12:** Project implementation agencies shall develop ordinances that promote waste prevention and recycling such as: requiring waste prevention and recycling efforts at all large events and venues; implementing recycled content procurement programs; and instituting ordinances to divert food waste away from landfills and toward food banks and composting facilities. **MM-PS.13:** Project implementation agencies shall develop environmentally				

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	friendly alternative waste management strategies such as composting, recycling, and conversion technologies. **MM-PS.14:** Project implementation agencies shall develop and site composting, recycling, and conversion technology facilities that are environmentally friendly and have minimum environmental and health impacts.				
Cumulative Impact 3.12-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to the response times of police and fire and emergency services in the SCAG region.	Less than significant. None required.	The impact would not be cumulatively considerable and would be **less than significant**.	LTS	LTS	LTS
Cumulative Impact 3.12-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to the staffing level of police and fire and emergency services in the SCAG region.	**MM-PS.15:** The growth inducing potential of individual 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 then will make any necessary adjustments to the applicable General Plan. Any such identified adjustment shall be communicated to SCAG. **MM-PS.16:** The project implementation agency shall identify projects in the 2008 RTP that require police protection, fire service, and emergency medical service and shall 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 shall be identified in each project's CEQA documentation.	The demand to hire and train new police, fire and emergency personnel would remain a **significant** impact.	S=	S=	S=
Cumulative Impact 3.12-6: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on urbanization patterns contributes to regional cumulatively considerable impacts to the number of school-age children and the demand for school facilities in different parts of the SCAG region.	**MM-PS.17:** Project implementation agencies shall undertake project specific review of the public utilities and services as part of project specific environmental review. For any identified impacts, project implementation agencies shall ensure that the appropriate school district has the school capacity, or is planning for the capacity, that the project will generate. Appropriate mitigation measures, such as new school construction or expansion, shall be identified. The project implementation agencies or local jurisdiction shall be responsible for ensuring adherence to the mitigation measures. SCAG shall be provided with documentation of compliance with	The region's cumulative demand for new schools and teachers would be a **significant** impact on public services.	S=	S=	S=

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	any necessary mitigation measures.				
Cumulative Impact 3.12-7: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence would create a cumulatively considerable impact to the demand for solid waste services in the SCAG region.	**MM-PS.18:** The California Integrated Waste Management Board shall continue to enforce solid waste diversion mandates that are enacted by the Legislature. **MM-PS.19:** Local jurisdictions shall continue to adopt programs to comply with state solid waste diversion rate mandates and, where possible, shall encourage further recycling to exceed these rates. **MM-PS.20:** Local jurisdictions shall 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-PS.21:** Project implementation agencies shall coordinate regional approaches and strategic siting of waste management facilities. **MM-PS.22:** Project implementation agencies shall 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 by making priority funding available for projects that involve co-location of facilities. **MM-PS.23:** Project implementation agencies shall 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-PS.24:** Project implementation agencies shall 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-PS.25:** SCAG shall encourage projects to reuse and recycle construction and demolition waste. **MM-PS.26:** SCAG shall encourage methane recovery in local landfills and wastewater treatment plants to generate electricity.	While disposal capacity for the solid waste in 2035 has been identified, the cumulative impacts of collecting solid waste, transporting it to an available facility, and disposing of it would remain **significant**.	S=	S=	S=
3.13 <u>Security and Emergency Preparedness</u>					
Impact 3.13-1: Implementation of the 2008 RTP could impair transportation safety, security, and reliability for people and goods in the region.	**MM-SEP.1:** SCAG shall help ensure the rapid repair of transportation infrastructure in the event of an emergency. • SCAG, in cooperation with local and state agencies,	Due to the geographic span and complexity of	S+	S=	S=

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	shall identify critical infrastructure needs necessary for: a) emergency responders to enter the region, b) evacuation of affected facilities, and c) restoration of utilities. • SCAG shall establish transportation infrastructure practices that promote and enhance security. **MM-SEP.2:** SCAG shall continue to promote the use of intelligent transportation system (ITS) technologies that enhance transportation security. • SCAG shall 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.	the SCAG region, the impact on transportation safety, security, and reliability for all people and goods in the region would remain **significant**.			
Impact 3.13-2: The RTP has the potential to inhibit the prevention, protection, response to, and recovery from major human-caused or natural events that could create a significant hazard to the public threatening and impacting lives, property, the transportation network and the regional economy.	SCAG does not intend to undertake a first response or emergency management role. SCAG seeks to become a conduit for coordination and collaboration among these stakeholders at the regional level. **MM-SEP.3:** 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 Department of Homeland Security grant projects, to enhance the regional transit security strategy (RTSS). • SCAG should 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	Due to the geographic span and complexity of the SCAG region, this impact would remain **significant**.	S+	S=	S=

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Table ES-3: 2008 RTP Impacts, Mitigation Measures and Comparison of Alternatives

IMPACT	MITIGATION MEASURES	2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
	disruption. • SCAG should establish a Transportation Security Working Group (TSWG) with goals of RTP consistency with RTSS, and to find ways SCAG programs can enhance RTSS. **MM-SEP.4:** SCAG shall establish a forum where policy makers can be educated and regional policy can be developed • SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety security policies. **MM-SEP.5:** 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-SEP.6:** 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. • 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-SEP.7:** SCAG will work to enhance emergency preparedness awareness among public agencies and with the public at large. • SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety security policies. **MM-SEP.8:** 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. • SCAG shall encourage and provide a forum for local				

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IMPACT	MITIGATION MEASURES	2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
	jurisdictions to develop mutual aid agreements for essential government services during any incident recovery **MM-SEP.9:** SCAG shall help to enhance the capabilities of local and regional organizations, including first responders, through provision and sharing of information. • 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-SEP.10:** SCAG shall provide the means for collaboration in planning, communication, and information sharing before, during, or after a regional emergency. • 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 should enter into 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.				
Impact 3.13-3: Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	**MM-SEP.11:** SCAG shall discourage development, or encourage the use of special design requirements, in areas with steep slopes, high fire, flood, and seismic hazards. **MM-SEP.12:** SCAG shall maintain Buffer Zones or natural areas for adequate protection of lives and properties against natural and man-made hazards. **MM-SEP.13:** SCAG shall discourage development on potentially hazardous	The mitigation measures would assure that the number of people or structures exposed to fire threat would be minimized. The impact after	LTS	LTS	LTS

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IMPACT	MITIGATION MEASURES		2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
		developments in hillsides, canyons, areas susceptible to flooding, earthquakes, wildfire and other known hazards, and areas with limited access for emergency equipment.	mitigation would be **less than significant**.			
	MM-SEP.14:	SCAG 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-SEP.15:	SCAG shall 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-SEP.16:	SCAG shall promote Fire Management Planning that help reduce fire threats in the region as part of the *Compass Blueprint and other ongoing regional planning efforts.*				
Cumulative Impact 3.13-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable fire threat to development in the SCAG region.	**MM-SEP.17:**	SCAG shall encourage local jurisdictions to strengthen and fully enforce fire codes and regulations.	The impact would remain **significant** because development would occur in areas that have a high, very high, or extreme threat of fire.	S+	S+	S-
	MM-SEP.18:	SCAG shall encourage the use of fire-resistant materials when constructing projects in areas with high fire threat.				
	MM-SEP.19:	SCAG shall encourage 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-SEP.20:	SCAG shall encourage reduction of fire threats in the region as part of the Compass Blueprint process and as part of other on-going regional planning efforts.				
	MM-SEP.21:	Project implementation agencies shall 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) 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-SEP.22:	Project implementation agencies shall 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.				

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IMPACT	MITIGATION MEASURES	2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
3.14 <u>Transportation</u>					
Impact 3.14-1: In 2035 there would be substantially more total daily Vehicle Miles of Travel (VMT) than the current daily VMT. Implementation of the 2008 RTP would contribute to this increase.	Measures intended to reduce vehicle miles traveled are part of the 2008 RTP. These include: increasing rideshare and work-at-home opportunities to reduce demand on the transportation system, investments in non-motorized transportation and maximizing the benefits of the land use-transportation connection and other Travel Demand Management measures. **MM-TR.1:** Beyond the currently financially and institutionally feasible measures included in the 2008 RTP, SCAG shall identify further reduction in VMT 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.TR-2:** Local governments should coordinate controlled intersections so that traffic passes more efficiently through congested areas. Where traffic signals or street lights are installed, require the use of Light Emitting Diode (LED) technology. **MM.TR-3:** Local governments 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.TR-4:** Local governments should create car-sharing programs. Accommodations for such programs include providing parking spaces for the car-share vehicles at convenient locations accessible by public transportation. **MM.TR-5:** Local governments 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.TR-6:** Local governments should encourage bicycling and walking by incorporate 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.	Implementation of measures beyond those institutionally and economically feasible measures identified in the 2008 RTP would be expected to reduce VMT, however even with this mitigation, the 2035 VMT would be substantially greater than the existing VMT. Therefore, the increase in VMT would remain a **significant** impact.	S+	S=	S=

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IMPACT	MITIGATION MEASURES	2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
Impact 3.14-2: In 2035 there would be substantially higher average Vehicle Hours Traveled (VHT) in delay than the current condition. Implementation of the 2008 RTP would contribute to this increase.	Measures intended to reduce vehicle hours of delay are part of the 2008 RTP. 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. Further reduction in VHT in delay would be obtained through the measures described for **Impact 3.14-1**.	Implementation of measures beyond those institutionally and economically feasible measures identified in the 2008 RTP would be expected to reduce VHT spent in delay for all vehicles, however even with this mitigation, the 2035 total vehicle VHT in delay would be substantially greater than the existing VHT in delay. Therefore, the increase in total vehicle VHT in delay would remain a **significant** impact.	S+	S=	S=
Impact 3.14-3: In 2035 there would be substantially greater average daily VHT in delay for heavy-duty truck trips than the current condition. Implementation of the 2008 RTP would contribute to this increase.	Mitigation measures intended to reduce daily heavy-duty truck vehicle hours of delay are part of the 2008 RTP. 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 (as described in the Project Description in Section 2.0). Further reduction in VHT in delay for *all* vehicles would be obtained through the implementation of the measures described for **Impact 3.14-1**. These mitigation measures could decrease VHT spent in delay for heavy-duty trucks.	Implementation of measures beyond those institutionally and economically feasible measures identified in the 2008 RTP would be expected to reduce VHT spent in delay for heavy trucks, however even with this mitigation, the 2035 heavy-duty truck VHT in delay would be substantially greater than the existing VHT in delay. Therefore, the increase in heavy-	S+	S=	S=

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		duty VHT in delay would remain a **significant impact.**			
Impact 3.14-4: Implementation of the 2008 RTP would contribute to an increase in the percent of work opportunities within 45 minutes travel time by personal vehicle or by transit in 2035, relative to the existing condition.	The impact would be beneficial. No mitigation measures are required.	**Beneficial.**	B	B	B
Impact 3.14-5: Implementation of the 2008 RTP would contribute to a lower system-wide fatality accident rate for all travel modes in 2035 compared to the existing condition.	The impact would be neutral. No mitigation measures are required. Implementation of the California Strategic Highway Safety Plan could reduce transportation related fatalities in the region and is referenced in the Regional Transportation Plan.	**No Impact.**	N	N	N
Impact 3.14-6: Implementation of the 2008 RTP would contribute to a lower system-wide injury accident rate for all travel modes in 2035 compared to the existing condition.	The impact is beneficial. No mitigation measures are required. The impact would be neutral. No mitigation measures are required. Implementation of the California Strategic Highway Safety Plan could reduce transportation related fatalities in the region and is referenced in the Regional Transportation Plan.	**Beneficial.**	N	B	B
Cumulative Impact 3.14-7: Implementation of the 2008 RTP would contribute to a cumulatively considerable amount of transportation impacts, such as VMT and all-vehicle VHT in delay, to counties outside of the SCAG region.	The mitigation measures described for **Impact 3.14.-1** would address this impact.	**Significant.**	S+	S=	S=
3.15 <u>Water Resources</u>					
Impact 3.15-1: Local surface water quality could be degraded by increased roadway runoff created by RTP projects, potentially violating water quality standards associated with wastewater and stormwater permits. RTP projects could alter the existing drainage patterns in ways that would result in substantial erosion or siltation.	The following mitigation measures are recommended: **MM-W.1:** Transportation improvements shall comply with federal, state, and local regulations regarding storm water management. State-owned highways and other transportation facilities are subject to compliance with a statewide stormwater permit issued to Caltrans. **MM-W.2:** Project implementation agencies shall 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-W.3:** Structural storm water runoff treatment shall 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	The mitigation measures would not fully mitigate water quality degradation, violation of water quality standards, or prevent erosion or siltation. The impact remains **significant**.	S-	S=	S=

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IMPACT	MITIGATION MEASURES	2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
	applies. **MM-W.4:** Implementation agencies shall 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-W.5:** Implementation agencies shall 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 shall 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-W.6:** Implementation agencies shall 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 shall comply with the Caltrans storm water discharge permit. Best Management Practices shall be identified and implemented to manage site erosion, wash water runoff, and spill control. **MM-W.7:** Projects requiring the discharge of dredged or fill materials into U.S. waters, including wetlands, shall 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-W.8:** In compliance with applicable municipal separate storm sewer system discharge permits as well as Caltrans' storm water discharge permit, long-term sediment control shall be effected through erosion control and revegetation programs designed to allow reestablishment of native vegetation on slopes and undeveloped areas. **MM-W.9:** Drainage of roadway runoff shall comply with Caltrans' storm water discharge permit. Wherever possible, roadways shall be designed to convey storm water through vegetated median strips that provide detention capacity and allow for infiltration before reaching culverts. The infiltration capacity of storm water runoff detention facilities shall be sized to minimize, to the greatest extent possible, the effect of increased impervious				

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IMPACT	MITIGATION MEASURES	2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
	surfaces.				
Impact 3.15-2: Increased impervious surfaces due to transportation projects would reduce groundwater infiltration.	**MM-W.10:** Project implementation agencies shall avoid designs that require continual dewatering where feasible. **MM-W.11:** Project implementation agencies shall ensure that projects that do require 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 shall comply with appropriate building codes and standard practices including the Uniform Building Code. **MM-W.12:** Treatment and control features such as detention basins, infiltration strips, and other features to control surface runoff and facilitate groundwater recharge shall 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-W.13:** Where feasible, transportation facilities shall not be sited in groundwater recharge areas, to prevent conversion of those areas to impervious surface.	Implementation of these mitigation measures would reduce the regional impact but impacts would remain **significant** due to the large areas of additional impermeable surfaces.	S-	S=	S=
Impact 3.15-3: The 2008 RTP could increase flooding hazards, by placing transportation investments, on alluvial fans and within 100-year flood hazard areas.	The following mitigation measures are recommended: **MM-W.14:** Natural riparian conditions near projects shall be maintained, wherever feasible, to minimize the effects of stormwater flows at stream crossings. Where feasible, riparian areas should be restored or expanded to mitigate additional impervious surface and associated runoff. **MM-W.15:** Implementing agencies shall assure projects mitigate for changes to the volume of runoff, where any downstream receiving waterbody 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 be 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-W.16:** Impacts shall be reduced to the extent possible by providing	After implementation of the mitigation measures, the 2008 RTP projects would regionally have a **less than significant** impact.	LTS	LTS	LTS

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	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, as required in MM-W.15. **MM-W.17:** All roadbeds for new highway and rail facilities should 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 shall be evaluated and projects shall be sited to avoid alluvial fan flooding where feasible. Delineation of floodplains and alluvial fan boundaries should attempt to account for future hydrologic changes caused by global climate change. **MM-W.18:** Transportation improvements shall comply with local, state, and federal floodplain regulations. Projects requiring federal approval or funding shall 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-W.19:** Improvement projects on existing facilities shall 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 shall be completed to eliminate increases in peak flow rates from current levels.				
Cumulative Impact 3.15-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in impacts to water quality.	Mitigation Measures W.1 through W.9 shall be applied to all urban development projects, as feasible, in addition to the following measures: **MM-W.20:** Local governments should encourage Low Impact Development and natural spaces that reduce, treat, infiltrate and manage stormwater runoff flows in all new developments. **MM-W.21:** Local governments should implement green infrastructure and water-related green building practices through incentives and ordinances. Green building resources include the U.S. Green Building Council's Leadership in Energy and Environmental Design, Green Point Rated Homes, and the California Green Builder Program. **MM-W.22:** Local governments should integrate water resources planning with existing greening and revitalization initiatives, such as street greening, tree planting, development and restoration of	The urban development expected by 2035 would create adverse water quality and waste discharge conditions and/or unfavorably alter existing drainage patterns in a manner that would result in substantial erosion or siltation. The 2008 RTP's influence on growth	S+	S+	S-

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	public parks, and parking lot conversions, to maximize benefits and share costs. **MM-W.23:** Developers, local governments, and water agencies should maximize permeable surface area in existing urbanized areas to protect water quality, reduce flooding, allow for groundwater recharge, and preserve wildlife habitat. New impervious surfaces should be minimized to the greatest extent possible, including the use of in-lieu fees and off-site mitigation. **MM-W.24:** SCAG shall continue to work with local jurisdictions and water quality agencies, through its Water Policy Task Force and other means, to encourage regional-scale planning for improved water quality management and pollution prevention. Future impacts to water quality shall be avoided through cooperative planning, information sharing, and comprehensive pollution control measure development within the SCAG region. This cooperative planning shall occur during as part of SCAG's ongoing regional planning efforts.	distribution is a cumulatively considerable contribution to this **significant** impact.			
Cumulative Impact 3.15-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in impacts to stormwater infiltration and groundwater recharge.	Mitigation Measures W.10 through W.13 shall be applied to all urban development projects, as feasible, in addition to the following measure: **MM-W.25:** SCAG shall continue to work with local jurisdictions and water agencies, to encourage regional-scale planning for improved stormwater management and groundwater recharge. Future adverse impacts shall be avoided through cooperative planning, information sharing, and comprehensive implementation efforts within the SCAG region. Meetings of SCAG's Water Policy Task Force and Regional Council offer an opportunity for local jurisdictions and water agencies to share information and strategies for improving regional performance in these efforts.	The urban development expected by 2035 would potentially affect stormwater infiltration and groundwater recharge. Future planning and implementation efforts may reduce the significance of this impact. However, given current conditions, the 2008 RTP's cumulative effects on stormwater infiltration and groundwater recharge would contribute to a **significant** impact on regional water resources.	S+	S+	S-

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Cumulative Impact 3.15-6: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in flooding hazard impacts.	Mitigation Measures W.14 through W.19 shall be applied to all urban development projects, as feasible, in addition to the following measure: **MM-W.26:** Local governments should prevent development in flood hazard areas that do not have appropriate protections, especially in alluvial fan areas of the region.	Urban development expected by 2035 would potentially result in additional structures in areas with flood hazards. Future planning efforts may reduce the significance of this impact; however, to assume that all flood hazards would be avoided would be speculative. The 2008 RTP's effect on population distribution and its associated contribution to the impact of flooding hazards is **significant**.	S+	S+	S-
Cumulative Impact 3.15-7: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the need for increased wastewater treatment capacity in the region by 2035. The proposed Plan influences population growth, resulting in an indirect and cumulative impact on wastewater treatment services.	**MM-W.27:** Local jurisdictions 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-W.28:** 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-W.29:** Local jurisdictions 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	The mitigation measures would lessen the impacts on wastewater treatment capacity in the region; however, they are not expected to prevent an imbalance between the demand for regional capacity and existing regional capacity. The 2008 RTP would make a cumulatively considerable contribution to this **significant** impact.	S=	S=	S+

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IMPACT	MITIGATION MEASURES	2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
	generate high volumes of wastewater until wastewater agencies have expanded capacity.				
Cumulative Impact 3.15-8: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to an increased demand for water supply and its associated infrastructure. Water agencies in the SCAG region produce many long-range planning studies to provide a system adequate to supply water demand, however the *existing* water supplies and infrastructure would not be sufficient to meet the expected demand in 2035.	**MM-W.30:** Project developers and agencies should consider 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. **MM-W.31:** Local water agencies 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-W.32:** Developers, local governments, and water agencies should include conjunctive use as a water management strategy when feasible. **MM-W.33:** SCAG shall encourage the kind of regional coordination throughout California and the Colorado River Basin that develops and supports sustainable policies in accommodating growth. **MM-W.34:** SCAG 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-W.35:** Developers and local governments 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. **MM-W.36:** Future impacts to water supply shall be minimized through cooperation, information sharing, and program development as part of SCAG's ongoing regional planning efforts. SCAG's Water Policy Task Force presents an opportunity for local jurisdictions and water agencies to share information and strategies (such as those listed above) about their on-going water supply planning efforts, including the following types of actions: • Minimize impacts to water supply by developing incentives, education and policies to further encourage water conservation and thereby reduce demand. • Involve the region's water supply agencies in planning efforts in order to make water resource information, such as water supply and water quality, location of recharge	Full implementation of these water supply mitigation measures may provide an adequate and reliable future water supply and infrastructure. The various water agencies update their Urban Water Management Plans to ensure that planning for the water needs of future growth is accommodated in a timely manner. However, CEQA requires the determination of significance to be based on a comparison between *existing* water supply and infrastructure and expected future demand. Although ensuring a reliable water supply for urban and other water demands in 2035 may be possible, the current, existing water supply and infrastructure would not be able to support the population in the Plan in 2035, and the specific, detailed solutions necessary	S=	S=	S=

Key:
+ Greater Adverse Impact than Proposed 2008 RTP
= Similar Impact as Proposed 2008 RTP
- Less Adverse Impact than Proposed 2008 RTP
B = Beneficial
LTS = Less-than-Significant
S = Significant
N = No Impact

Table ES-3: 2008 RTP Impacts, Mitigation Measures and Comparison of Alternatives

IMPACT	MITIGATION MEASURES	2008 RTP SIGNIFICANCE AFTER MITIGATION	No Project	Modified 2004 RTP	Envision
	areas and groundwater, and other useful information available to local jurisdictions for use in their land use planning and decisions. • Provide, as appropriate, legislative support and advocacy of regional water conservation, supply and water quality projects. • Promote water-efficient land use development. • The Water Policy Task Force and other ongoing regional planning efforts present an opportunity for SCAG to partner with the region's water agencies in outreaching to local governments, special water districts, and the California Department of Water Resources on important water supply issues. SCAG provides a unique opportunity to increase two-way communication between land use and water planners. The goals of the Task Force would not be to duplicate existing efforts of the water agencies.	to assure adequate water supply in 2035 have not yet been developed. Through its influence on regional growth, the 2008 RTP would make a cumulatively considerable contribution to this **significant** impact.			

Key:
+ Greater Adverse Impact than Proposed 2008 RTP
= Similar Impact as Proposed 2008 RTP
- Less Adverse Impact than Proposed 2008 RTP
B = Beneficial
LTS = Less-than-Significant
S = Significant
N = No Impact

CHAPTER 1
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 2008 Regional Transportation Plan (2008 RTP, Plan or Project). The 2008 RTP is a long-range regional transportation plan that provides a blueprint to help achieve a coordinated regional transportation system. The 2008 RTP 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 2008 RTP 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 projects are preliminarily identified in the 2008 RTP; 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. 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.

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 2008 RTP. 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 wide mitigation measures. This PEIR offers useful regional scale analysis and a framework of mitigation measures for subsequent, site

specific environmental review documents prepared by implementing agencies as individual projects in the 2008 RTP are developed. The PEIR mitigation measures similarly provide a framework of mitigation to be imposed by various Lead Agencies for individual development projects that comprise the assumed regional growth.

The focus of the environmental analysis in the PEIR is on the potential regional-scale and cumulative impacts of implementation of the 2008 RTP (Project) and the alternatives. The long range planning horizon of more than 25 years necessitates that many of the highway, arterial goods movement, and transit projects included in the 2008 RTP (and the alternatives) are identified at the conceptual level, and this document addresses environmental impacts to the level that they can be assessed without undue speculation. This PEIR acknowledges this uncertainty and incorporates these realities into the methodology to evaluate the environmental effects of the 2008 RTP, given its long term planning horizon.

The potential significant environmental effects of the Plan 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 Plan and alternatives were incorporated into the modeling analysis and into the socioeconomic projections. The specific techniques used to evaluate each potential environmental effect are fully described in each resource section in Chapter Three of this document.

Baseline for Determining Significance

The PEIR must identify significant impacts that would be expected to result from implementation of the 2008 RTP. 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 Three of this document, and represents the most recent, reliable, and representative data to describe current regional conditions. The criteria for determining significance are included in each resource section in Chapter Three of this document.

Comparison with the No Project

It is important to emphasize the urbanization in the SCAG region will increase substantially by 2035, with or without implementation of the 2008 RTP, and 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 of impacts; however, it provides a meaningful perspective on the effects of implementing the 2008 RTP. A direct comparison between the Plans and the No Project Alternative (described below) is included in each resource section of Chapter Three of this document.

Proposed Plan and Alternatives to the RTP

This PEIR evaluates a reasonable range of alternatives to the 2008 RTP, each at an equal level of detail. The alternatives evaluated include:

The **Proposed 2008 Plan** is a blueprint to help achieve a coordinated and balanced regional transportation system. The Plan contains transportation and urban form strategies that encourage compact growth, increased jobs/housing balance and centers-based development, where feasible, in all parts of the region. The proposed Plan is fully described in the Project Description (Chapter Two).

The **No Project Alternative** includes only those transportation projects that were programmed and/or received federal environmental clearance by December 2006, and projects in the first year of the 2006 TIP and projects under 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)).

The **2004 Modified RTP** Alternative is an update of the adopted 2004 RTP to reflect the most recent growth estimates and transportation planning decisions and assumptions. This alternative does not include all the urban form strategies included within SCAG's Compass Blueprint to the extent included within the Plan.

The **Envision** Alternative builds on the enhanced density and ideas of the SCAG Compass Blueprint and described in the Plan and goes further. It includes far more aggressive densities than the proposed plan and limits the single family housing that would be built in the region.

Each alternative maintains 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 the distribution because the different transportation investments and urban form strategies would be expected to support different regional distributions of population, households and employment.

Growth Scenarios

The RTP includes growth polices from the Compass Blueprint that encourage a more compact landform, with growth focused at transit nodes, centers and in areas 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 compared to the No Project (referred to as Baseline growth forecast in the Plan) -- 200,000 acres compared to up to 655,000 acres under the Plan. This EIR analyzes in detail the impacts of the Plan growth forecast as well as the No Project growth forecast. If 2008 RTP 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.

HSRT Orangeline

On December 6, 2007, SCAG's Regional Council voted in favor of including the HSRT Orangeline (from Irvine to Palmdale) in the 2008 RTP. While the Orangeline route has been analyzed in a qualitative manner; it was not included in the detailed GIS mapping and quantitative modeling for the 2008 RTP. Due to the size of the region and the complex nature of the analysis completed for the PEIR, the addition of this one component to the 2008 RTP does not make a sufficient difference such that it would change any of the conclusions presented herein. In general, the addition of this component to the 2008 RTP is within the error margin of the regional-scale modeling techniques and data presentation.

Mitigation Measures

Mitigation Measures proposed in this PEIR can be incorporated as policies in the Final 2008 RTP 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 RTP 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.

Public Participation Process

As the Metropolitan Planning Organization (MPO), SCAG is required to adopt and implement a Public Participation Plan to provide reasonable opportunities for interested parties to comment and be involved in the metropolitan transportation planning process. SCAG's Public Participation Plan, as amended in October 2007, addresses new requirements of the "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users" (SAFETEA-LU) (August 10, 2005). Further, 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, seek to assure that minority and low-income populations are involved in the planning process.

To fulfill these expectations, SCAG has used a combination of methods to stimulate public involvement. For the development of the 2008 RTP, the following public outreach methods were used:

- Presentations on the 2008 RTP to established organizations throughout the region
- Public workshops on the 2008 RTP throughout the region
- Posting of all public outreach events via an outreach calendar on SCAG's website
- Development of written and visual material to communicate the status and content of the 2008 RTP, including fact sheets and presentations
- A public comment form used throughout the outreach program (in person, at public meetings and online)
- SCAG's website, featuring a section dedicated to the 2008 RTP, including public meeting notices and the latest written information on the plan
- Outreach to media including newspapers editorial boards, local television and radio stations and ethnic media
- Selected radio and television appearances by elected officials and senior SCAG staff.

In addition to these targeted outreach efforts, all regular and special meeting of the RTP task forces, the Transportation and Communications Committee, the Energy and Environment Committee, the Community and Human Development Committee and the SCAG Regional Council are publicly noticed and opportunities for public comment are provided. Specific public comments on the RTP are being recorded and considered by SCAG in the development of the 2008 RTP.

In preparing the 2008 RTP, numerous task force committees (e.g. Goods Movement, Transit, etc.) worked for more than three years to identify and refine components of the Plan. Each assigned task force, comprised of elected officials and regional stakeholders, held numerous meetings focused on development of specific transportation modes, urban form strategies and environmental mitigation.

Environmental Review Process

The PEIR for the RTP was originally conceived as a joint PEIR for both the RTP and the RCP. Pursuant to CEQA Guidelines § 15082, the Notice of Preparation (NOP) for the 2008 RTP and RCP PEIR was released on June 27, 2007 and was received and circulated by the State Clearinghouse (SCH) on June 28, 2007. In response to NOP comments and a desire to encourage additional participation in the PEIR process, SCAG convened two PEIR scoping meetings that also included RTP and RCP workshops. These workshops were held on July 24 in Riverside and July 25 in Los Angeles. A copy of the original NOP is included in the Technical Appendix, along with transcripts from the scoping meetings. Written comments received on the NOP are also included in the Technical Appendix.

As a result of discussion and debate by SCAG's Regional Council, the project was rescoped to include only the RTP. A NOP was recirculated on November 7, 2007 describing this change in scope. The recirculated NOP and comments received in response to the second NOP are also

included in the Technical Appendix. Where appropriate and feasible, SCAG incorporated comments received into the scope and methodology of the environmental analysis of this document. Continuing participation from interested agencies and individuals is encouraged throughout the PEIR process.

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 2008 RTP 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: 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: Project Description. In this chapter the background and location of the RTP 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 2008 RTP is presented with the projected growth in the region. An overview of the major components of the 2008 RTP is also presented.

Chapter 3: Environmental Settings, Impacts and Mitigation Measures. This chapter identifies the setting for the 2008 RTP and provides a detailed analysis of the 2008 RTP for the region. It examines the environmental impacts of the 2008 RTP on the following resource categories: Aesthetics and Views, Biological Resources, Cultural Resources, Energy, Geology, Soils and Seismicity, Hazardous Materials, Land Use, Noise, Open Space, Population, Housing and Employment, Public Services and Utilities, Security, Transportation and Water Resources. For each of these environmental areas the analysis addresses the Environmental Setting, Regulatory Setting, Methodology, Significance Criteria, and Impacts and Mitigation.

Chapter 4: Comparison of Alternatives. In this chapter the RTP Alternatives are evaluated and compared to the 2008 RTP for each resource described above.

Chapter 5: Long Term Effects. This chapter identifies the significant unavoidable environmental changes, significant irreversible impacts, growth inducing impacts and cumulative impacts of the 2008 RTP.

Chapter 6: Report Authors, Organizations and Persons Consulted. This chapter lists the contributors to the preparation of this PEIR.

Chapter 7: Glossary. This chapter includes the acronyms used in the document.

Chapter 8: Map Chapter. This chapter includes all of the maps referenced throughout the PEIR.

Technical Appendices. The appendices include: the Notice of Preparations, Responses to Notices of Preparation, Air Quality Appendix including the Screening-level Health Risk Assessment (HRA), Attorney General Greenhouse Gas (GHG) Mitigation, and Greenhouse Gas calculations, Biological Resource Tables – including the California Department of Fish and Game Natural Diversity Database (CNDDB), Cultural Resources tables including Sites in the SCAG Region Listed on the Natural Register of Historic Places, national Historic landmarks and California Points of Historic Interest, and a Water Resources appendix with a water balance summary.

CHAPTER 2
Project Description

Background and Location

This PEIR evaluates the potential environmental impacts associated with the adoption of the 2008 RTP 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 §21000 et seq.) and CEQA Guidelines (14 California Code of Regulations, §15000 et seq.).

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

The SCAG region also contains 14 subregions as shown in **Map 2-2**. 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. This vast region includes nearly 25 million acres of which approximately 2.1 million acres are developed land, nearly 20 million acres are vacant, and the balance is agriculture, open space, recreation and other uses. The region is home to a population of nearly 19 million people and is expected to grow to 24 million by 2035[1].

The SCAG region encompasses several federally designated non-attainment and maintenance areas for air quality standards. The U. S. Department of Transportation, Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) under Section 176(c) of the Federal Clean Air Act [42 USC 7506(c)] require that a non-attainment area submit a regional transportation plan every four years. The 2008 RTP is the quadrennial update to the RTP that was last adopted in April 2004. 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 2008 RTP includes a horizon year of 2035. In order to

[1] Southern California Association of Governments, 2008 population projections.

continue receiving federal transportation funds for projects other than the projects included in the Regional Transportation Improvement Program (RTIP), the SCAG region must have a conforming RTP in place by June 2008.

SCAG is also required to prepare a regional transportation plan under 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 and the Department of Transportation (Caltrans) every four years. To ensure a degree of statewide consistency in the development of RTPs, the Commission 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 first four years of the plan must be consistent with the four-year State Transportation Improvement Program (STIP). California law views the STIP as a resource management document which provides each county and each region the opportunity to declare their intent to use available state and federal funds in a timely and cost-effective manner. The STIP must cover a period of four years, beginning July 1, and must include projects that are expected to receive funds prior to July 1 of the year of adoption.

Prior to adopting the 2008 RTP, SCAG's Regional Council must certify the PEIR for the Plan. Local and state transportation agencies will use the 2008 RTP and the PEIR as a reference for their own planning purposes.

The 2008 RTP is a long-range regional transportation plan that provides a blueprint for future transportation improvements based on specific transportation goals, objectives, policies and strategies. The plan includes the management of existing and proposed transportation systems and travel demand. Many projects from the 2004 RTP are included in the 2008 RTP as well as new transportation improvements. Some transportation projects from the 2004 RTP are now considered committed or at least reasonably foreseeable (i.e., they are in the RTIP and are thus included in the No Project condition).

The 2008 RTP is intended to meet the changing socioeconomic, transportation infrastructure, financial, technological and environmental conditions of the region. Individual projects are preliminarily identified in the 2008 RTP; 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. 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.

Purpose and Need for Action

The purpose of the 2008 RTP is to provide a clear, long term vision of the regional transportation goals, policies, objectives and strategies for the SCAG region. The Plan provides an assessment of current and projected demand for travel and goods movement in the region, and includes actions to meet the region's mobility and accessibility needs. These actions must be within fiscal constraints and should promote consistency and coordination among state, regional, and local transportation plans. The development of the Plan provides an integrated inclusive and flexible process to help foster regional consensus on the social, economic and environmental issues related to transportation planning in the SCAG region.

The need for the 2008 RTP arises from state and federal requirements and from the need for improvements to the regional transportation system. The need is driven by population growth and the need to maintain and preserve an aging existing transportation system to preserve its long term viability.

Over the next 25 years, SCAG forecasts that there will be an additional 5.14 million people (based on 2008 population estimates) added to this large and diversifying area. The 2008 RTP 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	320,446	314,104	103,000	101,000	133,000	132,000
Los Angeles	12,337,576	12,588,277	4,003,000	4,087,000	5,041,000	5,091,000
Orange	3,653,988	3,699,211	1,118,000	1,134,000	1,982,000	1,991,000
Riverside	3,596,681	3,472,034	1,183,000	1,142,000	1,414,000	1,387,000
San Bernardino	3,133,799	2,957,370	973,000	914,000	1,255,000	1,220,000
Ventura	1,013,756	1,025,250	330,000	334,000	463,000	466,000
SCAG Region	24,056,246	24,056,246	7,710,000	7,710,000	10,287,000	10,287,000

SOURCE: Southern California Association of Governments, 2008 Population Growth Estimates.

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 2008 RTP 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 2008

RTP to discuss the purpose and need for their individual projects in terms of the project's relationship to the Plan.

This statement of purpose and need has been prepared to identify the underlying purpose for adopting the 2008 RTP. This statement was not prepared to be a comprehensive statement of need for each individual RTP 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 2008 RTP is continuous as the region is constantly undergoing change. The 2008 RTP presents an assessment of the growth and economic trends in the SCAG region for the years 2003 (the RTP baseline) through 2035 and provides strategic direction for investments during this period. In order to update the Plan for the region, adjustments were required to the regional growth forecast, the airport strategy, the revenue forecast and the plans and programs as well as the incorporation of SCAG's ongoing Compass Blueprint Growth Vision process.

Proposed Action

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

The 2008 RTP 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 consistent with the RTP in order to receive federal funding. The 2008 RTP includes a policy element with goals, policies, and performance indicators, an action element that identifies projects, programs and implementation. In addition the RTP includes a description of regional growth trends to help identify future needs for travel and goods movement. The 2008 RTP consists of two sections: a financially constrained plan and a strategic plan. While the constrained plan includes projects that have committed, available, or reasonably available revenue sources, the strategic plan 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's constrained plan.

In addition to the financially constrained projects in the 2008 RTP, there are a number of "strategic projects." These are projects for which funding sources have not been identified, but the implementation of which would provide transportation and air quality benefit to the region. These projects include a number of High Speed Regional Transport (HSRT) segments, and user supported (i.e., toll) dedicated truck lanes. This EIR does not analyze these strategic projects because their funding and therefore 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 projects) as they may pass through environmentally sensitive areas. If these projects become reasonably foreseeable their impacts will be addressed in future RTPs and associated PEIRs.

Policy Element

The goals of the 2008 RTP have expanded from 2004 to encompass transportation security. These goals reflect the requirements of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The goals are provided in no particular order.

TABLE 2-2
RTP GOALS

RTP Goals
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 security of our transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies
Maximize the productivity of our transportation system
Protect the environment, improve air quality and promote energy efficiency
Encourage land use and growth patterns that complement our transportation investments

SOURCE: Southern California Association of Governments, 2008 Regional Transportation Plan

The goals demonstrate the need to balance many priorities in a cost-effective manner. These priorities are identified in the RTP as follows:

- The region's vast investments in multi-modal transportation infrastructure must be protected. This infrastructure is maturing and requires attention and maintenance. The region cannot afford to replace the existing infrastructure and must protect it for future generations.
- A maturing system dictates an increased operational focus that leverages technology to maximize the system's productivity. This same investment will also increase reliability by minimizing the variation of travel time due to incidents, weather and other factors. The region cannot expand the transportation system significantly, so the existing system must be utilized to its fullest. The viability of the region's economy is inextricably linked to efficient and reliable transportation. The region must be able to 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.
- Air quality for the region's residents must be improved and meet federal regulations. Not doing so would undermine the health of our population and risk losing billions of federal funding to the region.
- The investments in the RTP must address travel safety and modal balance; recognize the importance of providing safe travel choices; meet the needs of the transit dependent and the goods movement community; and provide connections among the highway system, ports, and airports.

- The RTP must also integrate land use policies as a means to influence transportation performance and the economy. Without such integration, transportation needs in the future will significantly outpace the ability to pay for them.
- The RTP must address all these priorities in the most cost–effective manner so that outcomes/benefits can be maximized and so that users get the most for their expenditures.

SCAG's Regional Council adopted five policies to guide the development of the RTP (**Table 2-3**). These policies, unchanged since 2004 when the previous RTP was prepared by SCAG, emphasize the importance of tracking the Plans' 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 will be RTP priorities and will be balanced against the need for system expansion investments.
3	RTP land-use and growth strategies that differ from currently expected trends will require a collaborative implementation program that identifies required actions and policies by all affected agencies and subregions.
4	HOV gap closures that significantly increase transit and rideshare usage will be supported and encouraged, subject to Policy #1.
5	Progress monitoring on all aspects of the Plan, including timely implementation of projects, programs, and strategies, will be an important and integral component of the Plan.

SOURCE: Southern California Association of Governments, 2008 Regional Transportation Plan

Performance Measures

As directed by the first RTP policy, performance measures play a critical role in the development of the 2008 RTP. Performance measures quantify the outcomes that are important to individuals, businesses, and the region. They quantify regional goals and provide a way to evaluate progress over time. This is SCAG's fourth performance-based RTP. The performance measures for the 2008 RTP represent an evolution that builds on earlier successes 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 RTP 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.

Transportation Strategies

The programs, projects and implementation actions of the 2008 RTP focus on system management, transportation demand management, strategic expansion and the land use transportation connection.

Transportation Safety

The 2008 RTP details ten measures that SCAG, as a planning agency, will undertake to enhance the region's ability to achieve and sustain at risk target levels of capability to prevent, protect against, respond to and recover from major human caused or natural events in order to minimize the threat and impact to lives, property and the region. The 2008 RTP commits $10 billion for safety related projects and services. Furthermore, in 2005, SAFETEA-LU required that each state develop a Strategic Highway Safety Plan; the 2008 RTP 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 2008 RTP. As discussed above, SCAG has developed performance measures to track and monitor the progress of the transportation system so that the region can make informed decisions regarding transportation investments. For example, the Freeway Performance Measurement System (PeMS), developed by UC Berkeley, Caltrans, and the California Partners for Advanced Transit and Highways (PATH), has the ability to measure freeway speeds, delay, and reliability for the regional freeway system. 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.

Maintenance and Preservation

Over the decades, the region has invested hundreds of billions of dollars in a multimodal transportation system. Preserving these assets is a critical priority, especially as preservation needs have been historically underfunded. On top of existing funding for preservation and maintenance, the region's highway system needs an additional $30 billion through 2035, and the arterial and transit system needs another $10 billion. The 2008 RTP commits $8 billion of new funding to preservation.

Integrated Land Use and Demand Management

Integrated Land Use

With the growing population, transportation infrastructure planning and technological innovation are essential to improving air quality. However, these strategies alone will not be enough to curb congestion and mitigate air quality impacts. Through the integration of land use planning and transportation infrastructure investments, land use strategies can encourage development patterns that increase transportation options and the use of alternate modes of travel to reduce vehicle miles traveled.

TABLE 2-4
RTP GOALS AND RELATED PERFORMANCE MEASURES

	Mobility	Accessibility	Reliability	Productivity	Safety	Sustainability	Preservation	Cost-Effectiveness	Environmental	Environmental Justice
RTP Goals										
Maximize mobility and accessibility for all people and goods in the region	x	x						x		x
Ensure travel safety and reliability for all people and goods in the region	x		x		x					
Preserve and ensure a sustainable regional transportation system						x	x		x	x
Maximize the productivity of our transportation system	x			x						
Protect the environment, improve air quality and promote energy efficiency						x			x	x
Encourage land use and growth patterns that complement our transportation investments and improves the cost-effectiveness of expenditures	x	x							x	
Maximize the security of our transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies*										

SOURCE: SCAG does not yet have an agreed-upon security performance measure, therefore it is not included in this table.

TABLE 2-5
PERFORMANCE MEASURES

Performance Measure	Measure(s)	Definition	Performance Target	Calculation Data Sources
Mobility	Speed. Delay.	Speed – experienced by travelers regardless of mode. Delay - excess travel time resulting from the difference between a reference speed and actual speed. Delay per capita can be used as a supplemental measure to account for population growth impacts on delay.	Improvement over Base Year	Travel demand model outputs. AM Peak, PM Peak, Off-peak, Daily Link speeds, travel times, trips
Accessibility	Percent PM peak period work trips within 45 minutes of home. Distribution of work trip travel times.		Improvement over Base Year	Travel demand model outputs. PM Peak, OD Travel Times, OD Person Trips
Reliability	Percent variation in travel time	Day-to-day change in travel times experienced by travelers. Variability results from accidents, weather, road closures, system problems and other non-recurrent conditions.	Improvement over Base Year	Highways – PeMS. Transit - National Transit Database or triennial audit reports.
Productivity	Percent capacity utilized during peak conditions	Transportation infrastructure capacity and services provided. Roadway Capacity - vehicles per hour per lane by type of facility. Transit Capacity - seating capacity by mode.	Improvement over Base Year	Highways – PeMS. Transit - National Transit Database or triennial audit reports.
Safety	Accident rates	Measured in accidents per million vehicle miles by mode for: Fatalities, Injuries, Property	“0” for all accident types and modes	Highways – freeway accident rates from Caltrans. Transit - National Transit Database or triennial audit reports.
Sustainability	Total cost per capita to sustain system performance at Base Year levels	Focus is on overall performance, including infrastructure condition. Preservation measure is a subset of sustainability.	Improvement over Base Year	Sub-regional submittals. Regional Population forecast.
Preservation	Maintenance cost per capita to preserve system at Base Year conditions.	Focus is on infrastructure condition. Subset of sustainability	Improvement over Base Year	Sub-regional submittals. Regional Population forecast.

TABLE 2-5 (Continued)
PERFORMANCE MEASURES

Performance Measure	Measure(s)	Definition	Performance Target	Calculation Data Sources
Cost Effectiveness	Benefit to Cost (B/C) Ratio	Ratio of benefits of travel alternatives to the costs of travel including infrastructure, maintenance, travel time, environmental, accident, and vehicle operating costs. This can be used to evaluate impacts of mode split changes resulting from RTP investments.	Improvement over Base Year	Travel demand model outputs. Revenue forecasts. RTP project expenditures. Other cost estimates.
Environmental	Emissions generated by travel	Measured/forecast emissions include CO, NOX, PM2.5, PM10, SOX, and VOC. CO2 as secondary measure to reflect greenhouse gas emissions.	Meet SIP Emission Budgets & Transportation Conformity requirements	Travel demand model outputs. EMFAC2007
Environmental Justice	Distribution of benefits and costs: Accessibility, Environmental, Emissions, Noise.	Share of net benefits and costs by mode, household income, race/ethnicity: RTP expenditures, taxes paid (e.g. income, sales & use, gas), Access to jobs (see "Accessibility"), travel time savings by mode, Environmental impacts from PEIR	Equitable distribution of benefits and costs	Travel demand model outputs. Revenue forecasts. RTP project expenditures. PEIR

SOURCE: Southern California Association of Governments, 2008 Regional Transportation Plan

Using an integrated forecasting approach and a consensus-built growth visioning process, SCAG developed growth policies that shape the 2008 RTP Policy Growth Alternative (i.e., the preferred growth alternative) in order to influence development patterns that reduce driving. The growth assumptions, vision, and policies were all developed in coordination with technical analyses, local input, land use and growth experts, and on-the-ground "reality checks." The resulting 2008 RTP growth projections indicate that modified growth patterns based on these policies show a direct positive impact on air quality in the region. SCAG's Compass Blueprint Growth Vision, in addition to legislative efforts, shapes the implementation program for enacting these policies and programs through partnerships with and services offered to cities, counties, subregions and county transportation commissions to ensure these positive effects on air quality.

Compass Blueprint Growth Vision

SCAG's Compass Blueprint Growth Vision, one of the first large-scale regional growth visioning efforts in the nation, seeks to integrate land use and transportation with the goal of accommodating approximately 5.14 million additional residents between 2008 and 2035, while improving mobility for all residents, fostering livability in all communities, enabling prosperity for all people, and promoting sustainability for future generations. 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
- Incorporate local input and feedback on future growth

The policies at the foundation of the 2008 RTP 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, vehicle hours traveled, 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.

Mobility Benefits of Land Use

SCAG prepared two growth forecasts in preparation of the 2008 RTP, a "baseline" growth forecast that does not include land use strategies and a "policy growth alternative" (used in the

Plan). The comparison of the transportation modeling results between the "baseline growth alternative" and the "policy growth forecast" isolates the transportation benefits due to regional land use policy. The following charts illustrate that the regional land use strategy of focusing development in existing and emerging centers, along transportation corridors, promoting transit-oriented and mixed use development and improving regional jobs-housing balance results in significant mobility benefits.

Compared to the "baseline" growth forecast, the adopted land use strategy reduces travel by more than 20 million vehicle miles traveled (VMT) per day (**Figure 2-1**), eliminates about 0.9 million hours of travel per day (**Figure 2-2**) and reduces daily congestion delay by 0.5 million hours (**Figure 2-3)**.

The 2008 RTP is built on the understanding that development, planned synergistically with the transportation system, can have a dramatic effect on travel behavior and VMT. The transportation modeling summarized above is consistent with this concept.

Additional analysis found that a simple proxy, such as residential density, land-use diversity and urban design, shows a very strong relationship with travel propensity. Specifically, commuting accounts for about 25 percent of household VMT, indicating that non-work travel is the primary source of household VMT. With a relationship that is closely tied to land-use, SCAG sought to quantify the characteristics of the environment to explain why travel behavior may differ in an urban versus a suburban setting. Recent research on the topic proposes a framework consisting of the three "Ds" – Density, Diversity and Design.

Density – the general concentration and proximity of activities, applied to both residential or employment density.

Diversity – the degree to which different land use effects are intermingled or "mixed" as well as the balance of that mix.

Design – the packaging of density and diversity, in terms of attractiveness, functionality and connectivity for pedestrians.

SCAG incorporated a fourth "D," regional transit accessibility, originally used in the Environmental Protection Agency Smart Growth Index (SGI) Model. This measure of the relationship between travel behavior and land use is critical given the 2008 RTP's focus of future development in activity centers, around new and existing transit stations and in nodes along corridors.

These variables were not specifically accounted for within the transportation and air quality modeling of individual TAZ (Traffic Analysis Zones). Since the SCAG regional model is insensitive to land use features below the aggregation level of the TAZ the "4D" model was used to estimate the incremental benefit attributable to local land use. This process concluded that the "4D" model is capable of yielding an additional reduction of 8.6 million daily VMT region-wide in addition to the 19 million daily VMT reduction modeled by SCAG.

FIGURE 2-1
DAILY VMT WITH AND WITHOUT LAND USE STRATEGY

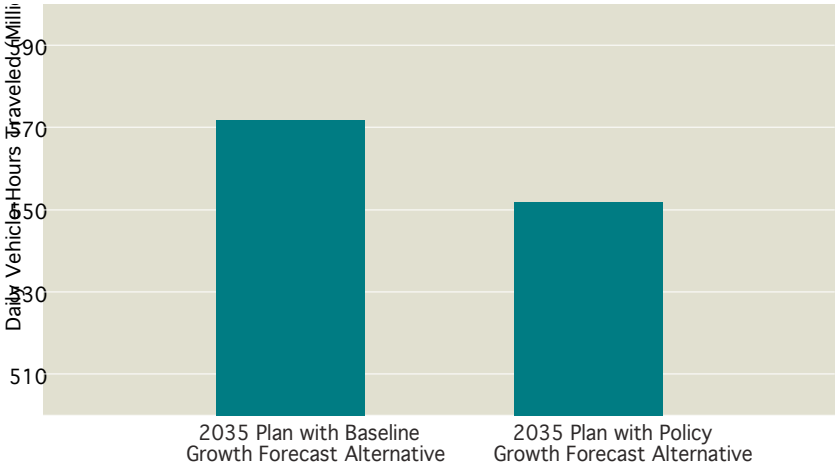


FIGURE 2-2
DAILY VHT WITH AND WITHOUT LAND USE STRATEGY

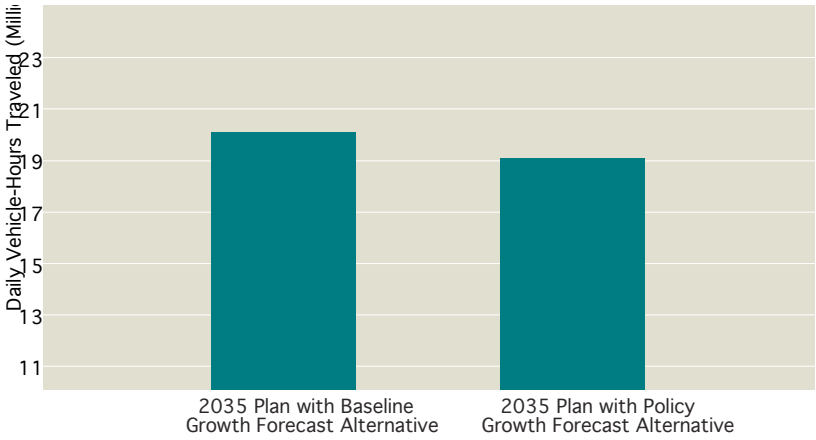
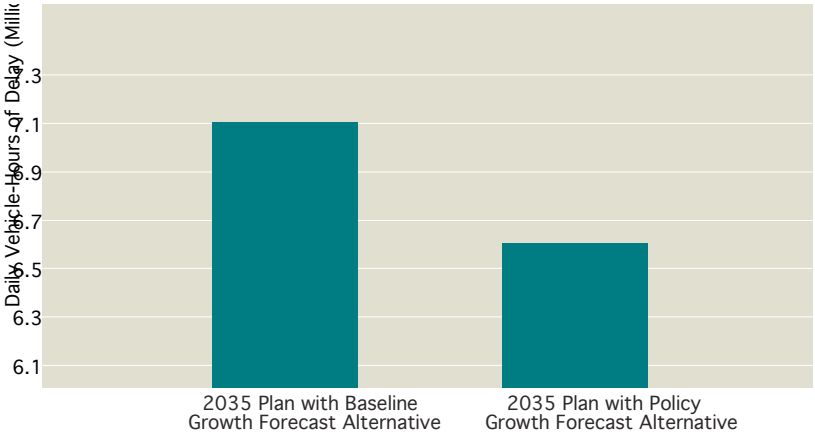


FIGURE 2-3
DAILY DELAY WITH AND WITHOUT LAND USE STRATEGY



Although this analysis and its benefits have not been incorporated into the 2008 RTP performance results, SCAG will continue to work with local state and federal stakeholders to further develop the "4D" approach and document its benefits for use in subsequent regional transportation plans. Additional information can be found in Appendix C of the 2008 RTP.

Travel Demand Management (TDM)

In an effort to address travel demand, TDM strategies are designed to influence an individual's travel behavior by making alternatives to the single-occupant automobile more attractive, especially during peak commute periods, or by enacting regulatory strategies. Some examples of TDM strategies are carpools and vanpools, public transit, non-motorized modes, congestion pricing, and providing the public with reliable and timely traveler information. In total, the 2008 RTP dedicates $2.2 billion to TDM investments.

Increasing Rideshare (Carpool and Vanpool)

The SCAG region continues to invest heavily in High Occupancy Vehicle (HOV) infrastructure that provides incentives for commuters to share rides with others. While HOV utilization is growing over time, the percent of total travelers using carpools and vanpools is not. SCAG and its partners will strengthen their efforts to encourage this efficient mode of travel.

Increasing Work-at-Home

Increasing the number of workers who work-at-home (self-employed, home-based business owners) or who telework/telecommute (wage and salary employees conducting some or all of their work from home) decreases home-based work trips, vehicle-miles of travel, congestion, and vehicle emissions. National and regional surveys of those who telecommute indicate that it is a lack of support and trust from "management," rather than the provision of equipment or the desire of workers to telecommute, that hampers the growth of telecommuting. Therefore, the 2008 RTP recommends formalizing and expanding partnerships among public and private sector stakeholders, and to promote telecommuting to increase opportunities for workers regionally to telecommute in lieu of daily commuting.

Non-Motorized Transportation

According to the 2001 National Household Travel Survey, 50 percent of all trips made nationwide in urban areas were shorter than 3 miles, and 28 percent of all trips were less than 1 mile. These trips are ideal for biking, walking, and transit or a combination of those modes of travel.

Region-wide, however, the average commute distance to work is 19.2 miles, too far for many bicyclists and all pedestrians. However, the integration between bicycle and transit nodes offers the opportunity to extend the commuting range of bicyclists.

Bicycle and pedestrian improvements are included as part of many larger street maintenance and construction projects. These investments and the supporting policies all aim to maximize the benefits of this efficient mode of transportation. In addition, the 2008 RTP supports several

policies that aim to work with local governments and increase the safety, convenience, and attractiveness of bicycling and walking as modes of travel.

Maximizing Transportation System Productivity

Beyond managing travel demand, this region needs to invest in maximizing the productivity of the existing system and increase its efficiency. The region has built a vast and expensive transportation system, which can be tweaked and modernized to carry more people and goods in a day or during peak commute conditions. Such investments include implementing advanced traffic control strategies such as signal coordination and ramp metering, improved incident management, and smaller physical infrastructure modifications such as auxiliary lanes. The 2008 RTP allocates an additional $2 billion, representing 20 percent of the region's operations improvement shortfall.

Strategic Transit Service Policies

The 2008 RTP encourages the regional transit operators to work cooperatively to offer complementary services, with ease of transfer between modes and operators. It further encourages utilization of new intelligent transportation system (ITS) technologies that measure system performance and offers its customers reliable "on-time" performance and real-time information.

System Expansion Projects

More than half of the available transportation revenues in the region are dedicated to the completion and expansion of the region's people and goods movement transportation systems.

Highway Improvements

Major categories of highway improvements included in the 2008 RTP are HOV lanes and connectors, mixed flow (or general purpose) lanes, toll facilities and High Occupancy Toll (HOT) lanes, and strategic arterial improvements. A significant number of system expansion projects have already been committed through SCAG's RTIP for the highway network. These priority projects close critical gaps in the system, relieve significant bottlenecks, and address inter-county travel needs.

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 rideshare rates. The 2008 RTP includes many additional investments to extend the HOV network, strategically closes gaps in the HOV network, and constructs additional direct freeway-to-freeway connectors to maximize the overall system performance by minimizing weaving conflicts and maintaining travel speeds. **Map 2-3** shows the 2035 HOV Lane System.

Mixed Flow

Since mixed flow lanes carry more traffic than any other component of our 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 2008 RTP includes a variety of mixed flow lane additions, mostly outside of Los Angeles County. **Map 2-4** shows the 2035 Mixed Flow transportation system.

Toll and High Occupancy Toll (HOT) Lane Corridors and Facilities

The 2008 RTP also includes an expansion of the existing HOT lane and toll road system in Orange County to address the congested commuter corridor between housing-rich Riverside County and job-rich Orange County. Additionally, improvements to several major corridors in other parts of the region are proposed to be financed by tolls, including the I-710 Tunnel Gap Closure and the High Desert Corridor. **Map 2-5** shows the 2035 HOT lanes and tolls.

Transit Strategies

The 2008 RTP recommends closing critical gaps in the transit system to improve service, and extend routes to serve a greater number of passengers. 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.

Heavy and light rail projects are planned for Los Angeles County, while Orange County focuses on several new bus rapid transit (BRT) corridors. Riverside and San Bernardino Counties are planning a mix of new rail and BRT projects. **Map 2-6** shows the 2035 transit system.

High-Speed Regional Transport

A HSRT system has the potential for relieving both airport and freeway congestion in urbanized areas by providing an alternative to the automobile as well as making less congested airports more accessible to air travelers, and providing alternative capacity for freight movement in the region. **Map 2-7** shows the 2035 HSRT system.

The HSRT system is a long-term vision to connect the region's ports, airports, and urban activity centers. The system can be constructed in multiple stages that can each be financially viable. The financial performance will be enhanced as the system is extended throughout the region and the volume of users increases. The HSRT plan is constructed in three core components: a goods movement/logistics component to connect the San Pedro Bay Ports with an inland port facility via the high-speed, high-capacity link; an aviation system component to create a direct and reliable link capable of connecting airports and urban centers; and a surface transport system component to link urban activity centers throughout the region.

Another high-speed regional transport project being studied is a magnetically levitated train between Las Vegas and Anaheim by the California-Nevada Super Speed Train Commission (CNSSTC) that would include an Anaheim-Ontario segment, which would further the airport decentralization strategy for the region. Also, the California High-Speed Rail Authority (CHSRA) is charged with planning, designing, constructing, and operating a high-speed steel wheels on steel rails train system that would connect northern and southern California. This system contains 210 miles planned in the SCAG region, including a 30-mile segment between Orange County and LA Union Station.

Aviation

SCAG's Regional Aviation Decentralization Strategy is very similar to the 2030 decentralized regional aviation system adopted for the 2004 RTP. It respects all legally-enforceable policy and physical capacity constraints at urban airports. It also assumes much more willingness on the part of the airlines to invest in new flights at new and emerging airports, and a package of market and ground access incentives to promote decentralization at under-utilized suburban airports.

Airport Ground Access

The Regional Aviation Decentralization Strategy calls for making substantial airport ground access improvements throughout the region, in both the short term and long-term. The short term program emphasizes relieving immediate bottlenecks around airports through arterial, intersection and interchange improvements, and increasing transit access to airports. To this end, SCAG is working closely with Los Angeles World Airports (LAWA) on planning and programming a regional system of FlyAways, based on the very successful Van Nuys FlyAway where passengers park their cars and take a bus to LAX. The locations of the proposed new FlyAways can be optimized by taking advantage of the region's developing HOV and light and heavy rail networks that can provide direct linkages to Ontario and Palmdale as well as LAX. Making seamless HOV and rail connections with enhanced service to those and other suburban airports will also compose SCAG's short- and medium-range airport ground access strategy. The FlyAway, HOV and rail improvements to the suburban airports will help establish a pattern of decentralization, by attracting a critical mass of passengers and airline service at those emerging airports. SCAG is also working with the newly-reactivated Southern California Regional Airport Authority (SCRAA) in it ongoing efforts to restructure and redefine its mission, with the focus of helping to implement the decentralization aviation strategy through facilitating key airport ground access improvements.

In the long run, however, the speed, reliability, and predictability of high-speed airport access will be needed to overcome the increasingly unpredictable traffic congestion. For example, the Initial Operating Segment (IOS) of the proposed HSRT system from West Los Angeles to Ontario will take only 33 minutes to travel from end to end. Therefore, the regional high-speed rail system is an integral component of the 2008 RTP Preferred 2035 regional aviation demand forecast.

Goods Movement Strategies

To enable the region to handle the dramatic growth in the goods movement sector, the 2008 RTP calls for approximately $13 billion in freight rail investments, nearly $18 billion in a freight HSRT system, and over $5 billion in highway investments. These investments integrate air quality mitigation into the goods movement system improvements, yielding substantial air quality benefits and reducing its current and long-term impacts on public health and the environment.

Dedicated Lanes for Clean Technology Trucks

Over the past several RTP updates, the region has been exploring dedicated truck-lane facilities and continues to refine the concept of user-supported corridors to improve the flow of goods. More recent efforts have focused on adding dedicated truck lanes for clean technology vehicles along truck-intensive corridors in Southern California. Operationally, such a corridor would be aligned to connect freight-intensive locations such as the Ports, warehousing/distribution center locations, and manufacturing locations. These dedicated facilities would have fewer entrance/egress locations than typical urban interstates to smooth the flow of trucks on these facilities.

Dedicated truck lanes have the potential to relieve many negative truck impacts such as recurrent delay, pavement deterioration, safety, emissions, and design deficiencies. Dedicated truck lanes would also increase reliability in the freeway system. Despite these benefits, substantial financial constraints as well as environmental impact considerations could hinder project implementation. The 2008 RTP includes the I-710 segment as the first phase of a comprehensive system that addresses truck-related issues in the region. This segment includes roughly 78 lane-miles (two lanes in each direction) of dedicated lanes for clean technology trucks along alignments extending from the Ports to the SR-60 interchange. This represents an investment of over $5 billion. A project level EIR/EIS and preliminary engineering are currently underway for the I-710. SCAG assumes the implementation of dedicated truck lanes accommodating clean technology vehicles along the I-710 corridor until a different preferred alternative is identified by the EIR/EIS.

Regional Freight Rail Investment and Emission Reduction Package

Freight rail investments consist of additional mainline capacity, grade separations, and locomotive engine upgrades. About half of the rail-related investments are for grade crossing separations, which reduce traffic congestion, improve safety, and reduce pollution. Substantial air quality benefits can be realized by accelerating fleet modernization with cleaner technologies.

Current estimates indicate that Union Pacific Railroad (UP) and Burlington Northern Santa Fe (BNSF) mainlines east of downtown Los Angeles will reach capacity before the end of the decade. As a result, they will need to be triple-tracked or even quadruple-tracked in some segments. Investments in the 2008 RTP include $3.2 billion in mainline rail capacity improvements, $6 billion to build an estimated 131 highway-rail grade separations east of downtown Los Angeles, and a total of $3.8 billion for accelerating upgrades to cleaner diesel

locomotive engines. **Map 2-8** shows the 2035 rail improvements and **Maps 2-9** through **2-12** show grade separations for Los Angeles, Orange, Riverside and San Bernardino Counties.

Alternative Technology-Based Goods Movement/Logistics

The region is also exploring new alternative technology-based systems that can provide greater throughput and reliability with fewer emissions than traditional rail (the emissions would be only those associated with electricity generation). A recent analysis carried out by the IBI Group considered the application of an HSRT system for the movement of containers (logistics and systems technology) to and from the San Pedro Bay Ports. This container movement system would provide a high-capacity, fast, and efficient method of moving container cargo from the Ports to an inland port facility in San Bernardino. The system capitalizes on the inherent savings of multiple uses on a single infrastructure by operating on shared alignments with the HSRT passenger system. The technology permits operation of HSRT freight vehicles on a shared guideway with passenger vehicles even during peak hour service. Freight vehicle trips can be interspersed with passenger trips while still meeting required passenger vehicle headways. Additionally, full utilization of the freight line can be achieved during the passenger system's off-peak hours. The deployment of the HSRT system would create value in associated components which could in turn contribute to the HSRT's total financial performance. The connection for the HSRT system would begin at the Ports and join up with the IOS at a point just east of Union Station (Hobart Yard). This alignment runs north-south and is assumed to follow a route parallel to the I-710/Alameda Corridor. After connecting to the IOS and other segments, the freight-only service would be interspersed with passenger service.

Table 2-6 summarizes the project types and costs associated with implementing the 2008 RTP. In addition, **Tables 2-7, 2-8 and 2-9** show the existing, No Project and 2008 RTP lane miles by county.

Mobility and Air Quality

The SCAG region has also experienced cleaner and healthier air quality over the past two decades due in part to collaborative efforts over the years to reduce emissions from stationary and mobile sources. However, even with these efforts, much of the region continues to exceed the National Ambient Air Quality Standards (NAAAQS) and the South Coast Air Basin (SCAB) still has the worst air quality in the nation. The majority of pollutants can be attributed to transportation.

TABLE 2-6
SUMMARY OF 2008 RTP PROJECT TYPES
(EXCLUSIVE OF MAINTENANCE AND MONITORING PROJECTS)

Project Type	Cost
Highway Improvements	$90.7 billion
Mixed Flow Lanes and Interchanges/Ramps	$25.1 billion
HOV	$8.0 billion
Toll Lanes	$40.0 billion
Arterial	$17.6 billion
Transit Improvements	$34.1 billion
Commuter Rail	$5.9 billion
Heavy Rail	$5.2 billion
Light Rail	$1.7 billion
Bus Rapid Transit	$0.6 billion
Bus	$17.5 billion
Other Transit	$3.2 billion
High-Speed Regional Transport	$29.1 billion
Goods Movement Strategies	$36.3 billion
Mainline Rail Capacity Improvements	$3.2 billion
Highway-Rail Grade Separations	$6.0 billion
Upgrade to Tier 4 engines	$3.8 billion
Alternative Technology-Based Goods Movement System	$17.9 billion
Dedicated Lanes for Clean Technology Trucks	$5.1 billion
Truck Climbing Lanes	$0.3 billion
Total	$190.2 billion

SOURCE: SCAG, 2008 Regional Transportation Plan

TABLE 2-7
EXISTING (2003) 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	375	0	323	673	2,374	0	3,744
Los Angeles	4,619	0	8,663	9,216	3,356	418	26,273
Orange	1,256	295	3,122	3,122	449	201	8,444
Riverside	1,671	0	1,192	3,016	3,411	54	9,344
San Bernardino	2,267	0	1,713	4,061	5,875	78	13,995
Ventura	495	0	874	979	623	1	2,971
Total Lane Miles by project type	10,683	295	15,887	21,067	16,088	752	64,771

SOURCE: SCAG (2007) Regional Travel Demand Model

TABLE 2-8
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	373	0	437	682	2,369	0	3,861
Los Angeles	4,656	0	8,810	9,332	3,343	511	26,651
Orange	1,282	500	3,183	3,128	450	225	8,769
Riverside	1,699	1	1,244	3,133	3,494	75	9,645
San Bernardino	2,472	0	1,784	4,230	6,036	93	14,615
Ventura	527	0	891	1,006	615	0	3,039
Total Lane Miles by project type	11,010	501	16,349	21,510	16,307	904	66,581

SOURCE: SCAG (2007) Regional Travel Demand Model

TABLE 2-9
2008 RTP 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	412	0	543	648	2,353	0	3,956
Los Angeles	4,749	144	9,118	9,340	3,355	570	27,276
Orange	1,422	541	3,202	3,168	439	243	9,016
Riverside	1,949	13	1,666	4,000	4,256	132	12,016
San Bernardino	2,710	0	2,966	4,678	5,907	206	16,467
Ventura	555	0	908	1,040	623	7	3,134
Total Lane Miles by project type	11,798	698	18,402	22,874	16,934	1,159	71,866

SOURCE: SCAG (2007) Regional Travel Demand Model

Environmental Justice

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. In the transportation-planning context, SCAG seeks to assure

that the plan benefits and burdens are not inequitably distributed within the region. A detailed analysis of the environmental justice analysis and methodology is contained in the plan.

SCAG's environmental justice program includes two main elements: public outreach and 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. These efforts include targeted outreach to minority and low-income communities throughout the region to assure that their concerns are heard and addressed. SCAG's 2008 RTP examines several performance measures to determine if there is a disproportionate negative impact of the Plan on any income, ethnic, or age group.

Proposed Plan and RTP PEIR Alternatives

The alternatives evaluated for the RTP PEIR include:

The **Proposed Plan**, which includes all of the elements summarized above, contains transportation/urban form strategies that encourage compact growth, increased jobs/housing balance, and centers based development where feasible, in all parts of the region.

The **No Project** Alternative includes only those programmed transportation projects that received federal environmental clearance by December 2006, projects in the first year of the 2006 RTIP and projects currently undergoing construction or right of way approval. These reasonably foreseeable projects fulfill the definition of the CEQA mandated "No Project Alternative."

The **2004 Modified RTP** Alternative is an update of the adopted 2004 RTP to reflect the most recent growth estimates and transportation planning decisions and assumptions. This alternative does not include urban form strategies included within SCAG's Compass Blueprint program to the extent included within the Plan.

The **Envision** Alternative builds on the enhanced density and ideas of the SCAG Compass Blueprint program as described in the Plan and goes further. It includes far more aggressive densities than the Proposed Plan alternative and limits the development of single family housing that would be built in the region.

Relationship to other EIRs

The 2008 RTP PEIR builds on the analysis and mitigation contained in the 2004 RTP PEIR. The project list of the 2008 RTP is similar to the project list for the 2004 RTP, although some of the transportation projects from the 2004 RTP are now considered committed and are included in the No Project Alternative. The 2008 RTP PEIR evaluates the most recent projects and policies and provides more direct comparisons between current conditions and expected future Plan conditions. The 2008 RTP PEIR includes additional analysis of cumulative, growth-inducing and other indirect impacts.

Intended Uses of the PEIR

SCAG will use this PEIR as part of its review and approval of the 2008 RTP. The lead agencies for individual projects may use this PEIR as the basis of their regional and cumulative impacts analysis. Moreover, 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 2008 RTP is intended to meet the changing socioeconomic, transportation infrastructure, financial, technological and environmental conditions of the region. Individual projects are preliminarily identified in the 2008 RTP; 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.

3.1 Aesthetics and Views

This chapter 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.

Environmental Setting

To begin this chapter, 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 then 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 the 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 to apply uniform standards to all areas within the region.

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

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1 Federal Highways, "Visual Impact Assessments for Highway Projects," retrieved online October 20, 2006 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

	Minor Intrusion	Moderate Intrusion	Major Intrusion
BUILDINGS: Residential Development, Commercial Development, 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 these are complementary 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 and visible but programmed/funded for removal and site restoration.	Not screened and visible by motorists. Will not be removed or modified. Scenic view is degraded.
STRIP MALLS			
		Neat and well landscaped. Single story. 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 scenic view.	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			
		Trees bordering highway remain 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: California Department of Transportation. (1996, March). Scenic Highways Program. Sacramento, CA.

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.** There are two Caltrans-designated vista points in the SCAG region: the Lamont/Odet vista point on SR-14 in Los Angeles County and the Indian Hill Road vista point on SR-243 in Riverside County.

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	40
38	San Bernardino	From east of South Fork Campground to 2.9 miles south of SR 18 at state line	16
62	Riverside	From State Route 10 north to the San Bernardino County line	9
74	Riverside	From west boundary of the San Bernardino National Forest to State Route 111 in Palm Desert	48
243	Riverside	From State Route 74 to the Banning city limit	28
91	Orange	From State Route 55 to east of Anaheim city limit	4

SOURCE: California Department of Transportation officially designated state scenic highways. Retrieved online http://www.dot.ca.gov/hq/LandArch/scenic_highways/ April 24, 2007.

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

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 included below.

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

Route	County	Location (From/To)	Post Miles
1	Orange/Los Angeles	1-5 SP 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 Canada Flintridge/SR 138	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 Blvd/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 Ray River/SR 91 Nr Corona	R46.5-41.5
15	San Bernardino	SR 58 Nr Barstow/SR 127 Nr Baker	R76.9-R136.6
18	San Bernardino	SR 138 Nr Mt. Anderson/SR 247Nr Lucerne	R17.7-73.8
27	Los Angeles	SR 1/Mulholland Drive	0.0-11.1
30	San Bernardino	SR 330 Nr Highland/SR 10 Nr Redlands	T-29.5-33.3
33	Ventura	SR 101 Nr Ventura/SR 150	0.0-11.2
33	Ventura/Santa Barbara/San Luis Obispo	SR 150/SR 166 in Cuyama Valley	11.-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 Nr City of Industry	19.9-R4.5
58	Kern/San Bernardino	SR 14 Nr Mjave/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
101	Los Angeles/Ventura/Santa Barbara/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 Mecca	57.6-18.4
111	Riverside	SR 74 Nr Palm Desert/I-10 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-OR5.8
127	San Bernardino/Inyo	I-15 Nr Baker/Nevada SL (All)	L0.0-49.4
138	San Bernardino	SR 2 Nr Wrightwood/SR 18 Nr Mt. Anderson	6.6-R37.0
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 Paula	0.0-34.4

TABLE 3.1-3 (CONT)
SCAG ROADWAYS ELIGIBLE FOR STATE SCENIC HIGHWAY DESIGNATION

Route	County	Location (From/To)	Post Miles
173	San Bernardino	SR 138 Nr Slvrwd Lk/SR 18 SO Lk Arwhd (All)	0.0-23.0
210	Los Angeles	1-5 Tunnel Station/SR 134	R0.0-R25.0
243	Riverside	SR 74 Nr MountainCntrl/I-10 Nr Banning (All)	0.0-29.7
247	San Bernardino	SR 62 Nr Yucca Valley/I-15 Nr Barstow (All)	0.0-78.1
330	San Bernardino	SR 30 Nr Highland/SR 18 Nr Running Springs (All)	29.5-44.1

SOURCE: California Scenic Highways System http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm retrieved online April 26, 2007.

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

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

One transit mode in the region is passenger rail operations (i.e., AMTRAK, Metrolink, MTA), which occupy existing railroad tracks and right-of-way areas. Passenger rail operations are 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. 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 (LAX), 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. In large part, this is 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 nearby residential areas.

Within the SCAG region, proximal views of takeoffs and landings of large commercial aircraft occur in proximity to 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.

Regulatory Setting

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.

Federal Agencies and Regulations

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 Agencies and Regulations

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 Agencies and Regulations

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.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the proposed 2008 RTP on aesthetics and views.

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 with the Plan to today); however it provides a meaningful perspective on the effects of the 2008 RTP.

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 §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 identifies the potential impacts of associated growth. The following factors were considered in assessing the significance of impacts from the proposed Plan on scenic resources:

Scale – the size, proportion, and sustainability (or "fit") of a transportation improvement to the surrounding area; and

Degree of visibility – the extent to which the transportation improvement can be seen. This depends to a large extent on route alignment and configuration (i.e., elevated, at grade, depressed, or underground) of the improvement. Generally, elevated and at grade transportation investments have a more substantial impact on aesthetics and views.

Significance Criteria

A significant impact is defined as "a substantial or potentially substantial, adverse change in the environment" (PRC§ 21068). The proposed Plan would have a significant impact on aesthetics and views if implementation would:

- Obstruct views of scenic resources or scenic vistas.

- Alter the appearance of scenic resources along or near designated scenic highways and vista points.
- Create significant contrasts with the overall visual character of the existing landscape setting or add visual elements of urban character to an existing natural, rural, and open space area.
- Result in a cumulatively considerable adverse effect on aesthetics and views.

Impacts and Mitigation Measures

Implementation of the 2008 RTP 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. Cumulative impacts include contrasts with the overall visual character of the existing landscape.

Both short-term construction related impacts and long-term or permanent impacts would occur as a result of implementation of the 2008 RTP. Below are descriptions of the types of direct impacts foreseeable from new transportation projects proposed in the 2008 RTP. Indirect impacts due to the changes in population distribution expected to occur due at least in part to the 2008 RTP's transportation investments and transportation and land use policies also are discussed under cumulative impacts.

Generally, proposed projects are of the following two types:

- **New Systems:** new facilities, goods movement roadway facilities, rail corridors, flyovers, interchanges, and HSRT.
- **Modifications to Existing Systems:** widening bridges, HOV, HOT, grade crossings, and maintenance operations.

The highway and arterial projects proposed in the 2008 RTP primarily consist of widening existing highways and constructing new interchanges. 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 2008 RTP would not involve construction activities. These projects would include transportation demand management and goods movement routing.

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.

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 projects proposing new systems (i.e., new facilities, goods movement roadway facilities, rail corridors, flyovers, interchanges, and HSRT). Construction and operation of projects proposed within the 2008 RTP 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.

The following discussion presents a first tier regional evaluation of potential impacts of 2008 RTP projects on scenic resources. However, it should be noted that significant impacts and appropriate mitigation measures would need to be identified and assessed on a project-by-project basis.

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.

Impact 3.1-1: Construction and implementation of individual 2008 RTP projects could obstruct views of scenic resources or scenic vistas.

Implementation of the transportation improvements in the proposed 2008 RTP could result in both short-term and long-term visual impacts by blocking views from transportation facilities or from the surrounding area. 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, flyovers, interchanges, goods movement roadway facilities, HSRT, and sound walls for RTP projects could block or impede views of mountains, oceans, or rivers.

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 2008 RTP 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 busways, goods movement roadway facilities, and HOV 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 and US-101 also have the potential to impact visual resources. In addition, construction of new HOV and truck lanes along I-5 in Los Angeles County is an example of a new highway project 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 2008 RTP transit improvements, if implemented, could affect the region's visual environment. As discussed above, the proposed 2008 RTP includes projects involving new systems, as well as projects that would involve modifications to existing facilities. New light rail transit projects in Los Angeles, such as the Orange Line and Gold Line extensions could also obstruct views, especially if all or parts of these lines are elevated.

Goods movement roadway facilities, such as dedicated truck lanes on I-710, SR-60 and I-15 from the Ports of Los Angeles and Long Beach to Barstow are examples of projects that could obstruct scenic views. The exact alignment of these goods movement roadway facilities, and whether or not the goods movement roadway facilities would be elevated, has not yet been decided. Adding new goods movement roadway facilities would 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 goods movement 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 initial operating segment (IOS) of the HSRT system, as currently planned, would run from West Los Angeles/LAX to Ontario International Airport, with stations at Union Station in downtown Los Angeles and West Covina. Further extensions to be completed by 2035 include an extension to San Bernardino, a potential Anaheim to Ontario line, a freight spur connecting the San Pedro ports to the IOS and the Orangeline from Irvine to Palmdale. Neither the exact alignment of the HSRT routes nor the location of the stations has been finalized. Provided that the system runs on an elevated track as currently projected, a substantial adverse impact on views toward the San Gabriel Mountains, San Jose Hills, the Puente Hills, and the Pacific Ocean could occur.

The proposed 2008 RTP 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.

This impact would be ***significant***.

Mitigation Measures

MM-AV.1: Prior to project approval, project implementation agencies shall implement design guidelines, local policies, and programs aimed at protecting views of scenic corridors and avoiding visual intrusions. Projects shall 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 projects shall minimize their intrusion into important viewsheds and use contour grading to better match surrounding terrain.

MM-AV.2: Prior to the issuance of permits, project implementation agencies shall require and projects shall, to the extent feasible, construct noise barriers of materials whose color and texture complements the surrounding landscape and development. Noise barriers shall 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. Landscaping shall use natural landscaping to minimize contrasts between the project and surrounding areas. Wherever possible, interchanges and transit lines at the grade of the surrounding land shall limit view blockage. The edges of major cut and fill slopes shall be contoured to provide a more natural-looking finished profile.

Significance after Mitigation

It is likely there will be situations where visual impacts cannot be mitigated to a less than significant. Therefore, impacts to visual resources would remain **significant** after mitigation.

Impact 3.1-2: Construction and implementation of projects in the RTP could potentially 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. **Table 3.1-4** lists all the scenic highways (designated and eligible) in the SCAG region and identifies the proposed improvement or action on that roadway as well as the potential impact. Along four of the scenic routes there would be only operational improvements under the proposed 2008 RTP, so there would be no visual change. Along other scenic highways, new travel, HOV, and managed lanes are proposed, as well as managed/HOV connectors.

SR-91 is one of the most congested freeways in the SCAG region. Caltrans has designated 4.2 miles of this freeway, from SR-55 to the eastern city limit of Anaheim, as a State Scenic Highway. The 2008 RTP includes improvements along SR-91 through Riverside and Orange Counties from I-15 to SR-241. These projects could impact this Scenic Highway. The 2008 RTP also includes improvements along SR-14 as part of the High Desert Corridor, connecting Palmdale and the Antelope Valley to Santa Clarita. These improvements to SR-14 include a state-designated vista point.

Table 3.1-4 and **Table 3.1-5** show the roadways eligible and designated State Scenic Highways in the SCAG region that have 2008 RTP projects planned.

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.

Implementation of Mitigation Measures AV.3 through AV.5 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

MM-AV.3: Project implementation agencies shall, where practicable and feasible, avoid construction of transportation facilities in state and locally designated scenic highways and/or vista points.

MM-AV.4: Prior to project approval, project implementation agencies shall complete design studies for projects in designated or eligible Scenic Highway corridors 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.

TABLE 3.1-4
PROJECTS PLANNED ON ROADWAYS ELIGIBLE FOR STATE SCENIC HIGHWAY DESIGNATION

Route	County	Location (From/To)	Post Miles	Improvement Planned
1	Orange/Los Angeles	1-5 SP San Juan Cap/SR 19 NR Long Beach	0.0-3.6	N/A
1	Los Angeles/Ventura	SR 187 Nr Santa Monica/SR 101 NR El Rio	32.2-21.1	Widening
2	Los Angeles/San Bernardino	SR 210 in La Canada Flintridge/SR 138	22.9-6.36	N/A
5	San Diego/Orange	Opposite Coronado/SR 74 NR San Juan Cap.	R14.0-9.6	Widening
5	Los Angeles	I-210 NR Tunnel Station/SR 126 NR Castaic	R44.0-R55.5	HOV/Truck lanes
8	San Diego/Imperial	Sunset Cliffs Blvd/SR 98 NR Coyote Wells	T0.0-R10.0	N/A
10	San Bernardino/Riverside	SR 38 NR Redlands/SR 62 NR Whitewater	30.9-29.7	Reconstruction/Widening
15	San Diego/Riverside	SR 76 NR San Luis Ray River/SR 91 NR Corona	R46.5-41.5	Reconstruction/Widening
15	San Bernardino	SR 58 NR Barstow/SR 127 NR Baker	R76.9-R136.6	Truck Lane Extension
18	San Bernardino	SR 138 NR Mt. Anderson/SR 247NR Lucerne	R17.7-73.8	Improvements/Realignment
27	Los Angeles	SR 1/Mulholland Drive	0.0-11.1	N/A
30	San Bernardino	SR 330 NR Highland/SR 10 NR Redlands	T-29.5-33.3	N/A
33	Ventura	SR 101 NR Ventura/SR 150	0.0-11.2	N/A

TABLE 3.1-4 (continued)
PROJECTS PLANNED ON ROADWAYS ELIGIBLE FOR STATE SCENIC HIGHWAY DESIGNATION

Route	County	Location (From/To)	Post Miles	Improvement Planned
33	Ventura/Santa Barbara/San Luis Obispo	SR 150/SR 166 in Cuyama Valley	11.-11.5	N/A
38	San Bernardino	SR 10 NR Redlands/SR 18 NR Fawnskin (All)	0.0-49.5	Widening/Lane additions
39	Los Angeles	SR 210 NR Azusa/SR 2	14.1-44.4	N/A
40	San Bernardino	Barstow/Needles	0.0-154.6	N/A
57	Orange/Los Angeles	SR 90/SR NR City of Industry	19.9-R4.5	Lane additions HOV/Widening
58	Kern/San Bernardino	SR 14 NR Mjave/I-15 Nr Barstow	112.0-R4.5	Construct expressway (new alignment)/widening
62	Riverside/San Bernardino	I-10 NR Whitewater/Arizona SL (All)	0.0-142.7	Widening
71	Riverside	SR 91 NR Corona/SR 83 NO Corona	0.0-G3.0	Widening
74	Orange/Riverside	I-5 NR San Juan Capistrano/I-111 (All)	0.0-R96.0	Widening/Lane additions
78	San Diego/Imperial	SR 79 NR SYsabel/SR 86 Passing NR Julian	51.1-13.2	N/A
79	San Diego/Riverside	SR 78 NR Santa Ysabel/SR 371 NR Aguanga	20.2-2.3	Realignment/Widening
91	Orange/Riverside	SR 55 NR Santa Ana Canyon/I-15 NR Cornoa	R9.2-7.5	Lane additions and reconstruction/Widening
101	Los Angeles/ Ventura/Santa Barbara/San Luis Obispo	SR 27 (Topanga Canyon Blvd)/SR 46 NR Paso Robles	25.3-57.9	Lane additions/HOV
111	Imperial/Riverside	Bombay Beach-Salton Sea SP/SR 195 NR Mecca	57.6-18.4	Widening/Lane additions
111	Riverside	SR 74 NR Palm Desert/I-10 NR Whitewater	39.6-R63.4	Widening
118	Ventura/Los Angeles	SR 23/Desoto Ave/NR Browns Canyon	17.4-R2.7	Widening
126	Ventura/Los Angeles	SR 150 Nr Santa Paula/I-5 NR Castaic	R12.0-OR5.8	Widening/additions
127	San Bernardino/Inyo	I-15 NR Baker/Nevada SL (All)	L0.0-49.4	N/A
138	San Bernardino	SR 2 NR Wrightwood/SR 18 NR Mt. Anderson	6.6-R37.0	Widening/Lane addition
142	San Bernardino	Orange CL/Peyton Dr.	0.0-4.4	Widening
150	Santa Barbara/Ventura	SR 101 NR Ventura/SB CL/SR 126 Nr Santa Paula	0.0-34.4	N/A
173	San Bernardino	SR 138 NR Slvrwd Lk/SR 18 SO Lk Arwhd (All)	0.0-23.0	N/A

SOURCE: SCAG 2008 Project List

TABLE 3.1-5
PROJECTS PLANNED ON ROADWAYS DESIGNTED AS STATE SCENIC HIGHWAYS

Route	County	Location (From/To)	Post Miles	Improvement Planned	Route
2	Los Angeles	From three miles north of SR 210 (at La Canada) to San Bernardino County line	55	N/A	2
33	Ventura	From six miles north of SR 150 to Santa Barbara County line	40	N/A	33
38	San Bernardino	From east of South Fork Campground to 2.9 miles south of SR 18 at state line	16	N/A	38
62	Riverside	From State Route 10 north to the San Bernardino County line	9	N/A	62
74	Riverside	From west boundary of the San Bernardino National Forest to State Route 111 in Palm Desert	48	N/A	74
243	Riverside	From State Route 74 to the Banning city limit	28	N/A	243
91	Orange	From State Route 55 to east of Anaheim city limit	4	Add lanes	91
243	Riverside	SR 74 NR MountainCntrl/I-10 NR Banning (All)	0.0-29.7	N/A	243
247	San Bernardino	SR 62 NR Yucca Valley/I-15 Nr Barstow (All)	0.0-78.1	Widening	247
330	San Bernardino	SR 30 NR Highland/SR 18 NR Running Springs (All)	29.5-44.1	N/A	330

SOURCE: SCAG 2008 RTP Project List

MM-AV.5: If transportation facilities are constructed in state- and locally-designated scenic highways and/or vista points, design, construction, and operation of the transportation facility shall be consistent with applicable guidelines and regulations for the preservation of scenic resources along the designated scenic highway.

Significance after Mitigation

It is likely there will be situations where visual impacts cannot be mitigated to a less than significant. Therefore, impact to visual resources would remain **significant** after mitigation.

Impact 3.1-3: Construction and implementation of projects included in the 2008 RTP could 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 2008 RTP 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 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).

In urbanized areas, roadways and ancillary improvements such as sound walls introduced by the proposed 2008 RTP 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 level 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. However, projects such as the extension of the Foothill South/SR-241 and the High Desert Corridor have the potential to create significant visual impacts along their respective project corridors.

As already mentioned, proposed projects in the 2008 RTP include construction of roadway improvements such as grade separated facilities for busways, goods movement roadway facilities, and HOV connectors, as well as construction of the HSRT 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.

Implementation of Mitigation Measures AV.6 through AV.9 would reduce the affects of introducing urban elements to rural areas; however, the impacts would remain **significant.**

Mitigation Measures

MM-AV.6: Project implementation agencies shall develop design guidelines for each type of transportation facility that make elements of proposed facilities visually compatible with surrounding areas. Visual design guidelines shall, at a minimum, include setback buffers, landscaping, color, texture, signage, and lighting criteria. The following methods shall be employed whenever possible:

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

MM-AV.7: Project implementation agencies shall design projects to minimize contrasts in scale and massing between the project and surrounding natural forms and development. Project implementation agencies shall 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 shall be designed to add significant natural elements and visual interest to soften the hard-edged, linear travel experience that would otherwise occur.

MM-AV.8: Project implementation agencies shall use natural landscaping to minimize contrasts between the project and surrounding areas. Wherever possible, interchanges and transit lines shall be designed at the grade of the surrounding land to limit view blockage. Edges of major cut-and-fill slopes should be contoured to provide a more natural looking finished profile. Project implementation agencies shall replace and renew landscaping to the greatest extent possible along corridors with road widenings, interchange projects, and related improvements. New corridor landscaping shall be designed to respect existing natural and man-made features and to complement the dominant landscaping of surrounding areas.

MM AV-9: Project implementation agencies shall construct sound walls of materials whose color and texture complements the surrounding landscape and development and to the maximum extent feasible, use color, texture, and alternating facades to "break up" large facades and provide visual interest. Where there is room, project sponsors shall landscape the sound walls with plants that screen the sound wall, preferably with either native vegetation or landscaping that complements the dominant landscaping of surrounding areas.

Significance after Mitigation

It is likely there will be situations where visual impacts cannot be mitigated to a less than significant. Therefore, impact to visual resources would remain **significant** after mitigation.

Cumulative Impact 3.1-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP influences the pattern of this urbanization, by increasing mobility and including land-use-transportation measures. At the regional scale, the 2008 RTP's contribution to impacts on the overall visual character of the existing landscape setting would be cumulatively significant.

In addition to transportation investments, the 2008 RTP includes land use policies that would affect the regional distribution of population, households, employment, and facilities and could impact aesthetics and views. The primary land use strategy discussed in the 2008 RTP emphasizes focusing development in urban areas, or infill development. Infill may result in taller buildings that obstruct views. However, an infill strategy will also help preserve open space in the region, thereby protecting many scenic resources.

The region will add approximately 5.14 million people, 2 million households, and 2.5 million jobs by 2035. Some of these people will live in households and work at jobs on land that is currently vacant. This conversion of vacant land to residential or other uses would have a significant impact on aesthetics and views. As stated in Chapter 3.8 Land Use, the proposed growth is estimated to create an urban footprint that will consume approximately 200,000 acres of currently vacant, agricultural or open space/recreation land. As a result of the population growth expected to occur in the region over the next 30 years, contrasts with existing visual character will occur either due to increased land use intensity in urban areas or due to development of previously vacant lands. Although implementation of Mitigation Measure AV.9 would reduce potential cumulative impacts, the impacts would be considered cumulatively considerable.

Mitigation Measures

Mitigation measures identified above (MM-AV.1 through MM-AV.9) for 2008 RTP projects should also be implemented as applicable to development projects throughout the region.

MM-AV.10: In visually sensitive site areas and prior to project approval, local land use agencies shall 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.

Significance after Mitigation

This impact would remain **significant** because the population growth projected by 2035 in combination with the projects in the 2008 RTP would consume approximately 200,000 acres of land that is currently vacant resulting in contrasts with the overall visual character of the existing landscape setting.

Comparison With The No Project Alternative

In the No Project Alternative, the population of the SCAG region would still grow by about 5.14 million people, however no regional transportation investments would be made above the existing programmed projects. The population distribution would follow past trends, uninfluenced by additional transportation investments.

Direct Impacts

Since the No Project Alternative includes fewer transportation projects than the 2008 RTP, it would have a lesser impact in terms of obstructing views and scenic resources, creating contrasting land uses and adding visual elements to existing natural, rural, and open space areas. The No Project would not affect any State Scenic Highways or vista points.

The Plan impacts would be greater than the No Project impacts for Impacts 3.1-1, 3.1-2, 3.1-3, and 3.1-4.

Cumulative Impacts

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 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. As a result, under the No Project Alternative, greater consumption of vacant, open space/recreation and agricultural lands could occur across the region (about 655,000 acres compared to about 200,000 acres under the Plan). The proposed Plan also includes transportation improvements that facilitate access to undeveloped lands, making those lands more attractive for development than under the No Project Alternative. As a result, population and economic growth could occur in areas of the region that are currently not developed, the Plan would also result in greater densification of growth. The proposed Plan includes additional households and jobs associated with the economic benefits of implementing the Plan that could consume additional land as well as increasing development densities. In contrast, the No Project Alternative could result in unplanned growth extending in to more vacant, open space/recreational and agricultural lands than under the Plan. As such, it is expected that the No Project Alternative and the Plan would

cumulatively create similar types of contrasts with the overall visual character of the existing landscape setting. However, it is anticipated that the land use planning strategies included in the RTP will minimize consumption of vacant, open space/recreation and agricultural lands compared to the No Project Alternative (about 200,000 acres under the Plan and about 655,000 acres under the No Project Alternative).

The Plan impacts would be less than the No Project impacts for Cumulative Impact 3.1-5.

Residual Impacts

Mitigation measures are anticipated to reduce the quantity and severity of visual impacts to panoramic views, views of significant landscape features, or landforms. However, the ability of mitigation measures to completely account for all visual impacts would depend on project design. Design information about facilities that would potentially impact visual resources is not available at this time. Therefore it is not feasible to conclude that all impacts to open space areas could be mitigated to a less-than-significant level of significance, and the potential impacts are therefore considered to be **significant** and unavoidable.

The mitigation measures listed above would be expected to reduce significant visual impacts for projects that could potentially alter the appearance of state designated or eligible scenic highways or alter views from such scenic highways to a less than significant level when incorporated by project proponents. The mitigation measures listed above would also be expected to reduce significant visual impacts for projects that could potentially add a visual element of urban character to an existing rural or open space area or add a modern element to a historic area to a less than significant level when incorporated by project proponents.

References – Aesthetics and Views

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3.2 Air Quality

This chapter analyzes local, regional, and global air quality issues, identifies the potential impacts of the RTP on air quality, includes mitigation measures for the impacts, and evaluates the residual impacts.

Environmental 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 Region, health effects of air pollutants, regulatory setting, and existing air quality.

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.

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 and air districts are shown in **Map 3.2-1**, respectively.

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 South Coast Air Basin were changed by the California Air Resources Board (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.[1]

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.[2]

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 mph, smog potential is greatly reduced.[3]

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. The climate is characteristic of a desert environment. The intervening mountain ranges block cool, moist coastal air and create hot, dry summers and cool winters. Meteorology is influenced by a moderately intense anti-cyclonic circulation, except during periods of frontal activity during the winter. On average, 20-30 frontal systems (i.e. storms) move into the MDAB each winter.[4]

The MDAB experiences high prevailing winds primarily from the south and west, which results in a visible "smog wall" being transported from SCAB through mountain passes. The exchange of lower and upper air tends to accelerate surface winds during the warm part of the day when convection is at a minimum. During the winter the rapid cooling of the surface layers at night retards this exchange of momentum, which often results in calm winds.[5]

The inversion conditions in the MDAB are much less favorable for the build-up of high ozone concentrations than in the coastal areas of Southern California. When subsidence inversions occur, they are generally 6,000 to 8,000 feet above the desert surface, allowing much greater vertical mixing than along the coast where the inversion base is often much lower. As a result,

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1 South Coast Air Quality Management District, *CEQA Air Quality Handbook*, April 1993, p. A8-1.

2 South Coast Air Quality Management District, *CEQA Air Quality Handbook*, April 1993, p. A8-2.

3 Ibid.

4 Mojave Desert Air Quality Management District, *Triennial Revision to the 1991 Air Quality Attainment Plan*, January 1996.

5 Ibid.

meteorology in the MDAB is less favorable for the chemical mixing characteristic of typical ozone formation. [6]

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. [7]

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. [8]

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 humidities, 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.[9]

The combination of subsiding air, protective mountains and distance from the ocean all combine to severely limit precipitation. Rainfall is highly variable with precipitation from a single heavy storm exceeding the entire annual total during a later drought condition.[10]

Humidities are low throughout the year, ranging from 28 percent in summer to 52 percent in winter. The large daily oscillation of temperature produces a corresponding large variation in the relative humidity. Nocturnal humidities rise to 50-60 percent, but drop to about 10 percent during the day. [11]

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 ($\pm$31 mph) are observed 0.6% 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. [12]

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6 Ibid.
7 Imperial County Air Pollution Control District, *1991 Air Quality Attainment Plan*, April 1992.
8 Ibid.
9 Ibid.
10 Ibid.
11 Ibid.
12 Ibid.

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.[13]

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.[14]

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. 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.[15]

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.[16] 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

13 Ibid.
14 Ibid.
15 Ventura County Air Pollution Control District, *1994 Air Quality Management Plan*, November 1996.
16 Ibid.

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.[17]

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.[18]

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.[19]

Health Effects

This section considers the health effects of air pollution, including “criteria air pollutants” and “toxic air contaminants.” The term “criteria air pollutants,” refers to those pollutants that are pervasive in urban environments and for which health-based state ambient air quality standards have been established. The term “toxic air contaminants,” refers to those pollutants which occur at relatively low concentrations and are associated with carcinogenic and other adverse health effects, but for which no ambient air quality standards have been established.

Criteria Pollutants

Health-based air quality standards have been established by California and the federal government for the following criteria pollutants: ozone, CO, NO2, PM10, PM2.5, SO2, and lead. California also includes standards for sulfate and visibility.

The following summarizes the health effects of the criteria pollutants[20]

Ozone (O_3)

Ozone (O3), a colorless gas with a sharp odor, is a highly reactive form of oxygen. High ozone concentrations exist naturally in the stratosphere. Some mixing of stratospheric ozone downward through the troposphere to the earth's surface does occur; however, the extent of ozone transport is limited. At the earth's surface in sites remote from urban areas ozone concentrations are normally very low (0.03-0.05 ppm).

While ozone 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.

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17 VCAPCD, *1994 Air Quality Management Plan*, November 1996.
18 Ibid.
19 Ibid.
20 SCAQMD, Final EIIR for the 2007 Air Quality Management Plan, June 2007

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells and ambient ozone concentrations in the Basin are frequently sufficient to cause health effects. Ozone 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 ozone effects. Short-term exposures (lasting for a few hours) to ozone 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 ozone 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 ozone communities. Elevated ozone levels are also associated with increased school absences.

Ozone exposure under exercising conditions is known to increase the severity of the abovementioned observed responses. Animal studies suggest that exposures to a combination of pollutants which include ozone may be more toxic than exposure to ozone 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.

Particulate Matter (PM10 and PM2.5)

Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (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, the elderly, exercising adults, and those suffering from asthma 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, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in fine particulate matter 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 particulate matter.

The elderly, people with pre-existing respiratory and/or cardiovascular disease and children appear to be more susceptible to the effects of PM10 and PM2.5.

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, carbon monoxide 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. In 2002, approximately 98 percent of the CO emitted into the Basin's atmosphere was from mobile sources. Consequently, CO concentrations are generally highest in the vicinity of major concentrations of vehicular traffic.

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 ozone, 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, conditions with 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.

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.

Sulfur Dioxide (SO_2)

SO2 is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H2SO4), which contributes to acid precipitation, and sulfates, which are components of PM10 and PM2.5. Most of the SO2 emitted into the atmosphere is produced by burning sulfur-containing fuels.

Exposure of a few minutes to low levels of SO2 can result in airway constriction in some asthmatics. All asthmatics are sensitive to the effects of SO2. 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 SO2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO2.

Animal studies suggest that despite SO2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract.

Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO2 levels. In these studies, efforts to separate the effects of SO2 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.

Nitrogen Dioxide (NO_2)

NO2 is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N2) and oxygen (O2) 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 NO2. NO2 is responsible for the brownish tinge of polluted air. The two gases, NO and NO2, are referred to collectively as NOx. In the presence of sunlight, NO2 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 (HNO3) which reacts further to form nitrates, components of PM2.5 and PM10.

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 NO2 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 NO2 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 NO2 exposures and cardiopulmonary mortality, decreased lung function, respiratory symptoms and emergency room asthma visits.

In animals, exposure to levels of NO2 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 ozone and NO2.

Sulfates

Sulfates are chemical compounds which contain the sulfate ion (SO4 =), and are part of the mixture of solid materials which make up PM10. Most of the sulfates in the atmosphere are

produced by oxidation of sulfur dioxide. Oxidation of sulfur dioxide yields sulfur trioxide (SO3) which reacts with water to form sulfuric 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 fine particles 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 particles remains unresolved.

Lead (Pb)

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

Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead 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 lead levels are associated with increased blood pressure.

Lead poisoning can cause anemia, lethargy, seizures, and death. It appears that there are no direct effects of lead on the respiratory system. Lead 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 lead because of previous environmental lead exposure of their mothers.

Table 3.2-1 presents the peak readings of criteria pollutants in the air basins of the SCAG Region.

Toxic Air Contaminants

Toxic air contaminants (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. Toxic air contaminants 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

TABLE 3.2-1
PEAK CRITERIA POLLUTANTS READINGS FOR THE SCAG REGION AIR BASINS

Pollutant	Pollutant Standards		2004 Peak Criteria Reading		Days in Excess of Standards 2004		2005 Peak Criteria Reading		Days in Excess of Standards 2005		2006 Peak Criteria Reading		Days in Excess of Standards 2006	
	State	National			State	National			State	National			State	National
South Coast Air Basin														
Ozone-hourly	0.09 ppm	--	0.163		105	28	0.182		99	31	0.175		102	35
Ozone-8 hour	0.07 ppm	0.08	0.145		--	88	0.145		--	83	0.142		--	85
PM10	50 µg/m³	150 µg/m³	National 137.0	State 133.0	70	--	131.0		67	--	National 142.0	State 135.0	69	--
Carbon Monoxide	9 ppm	9 ppm	6.5		0	0	5.87		0	0	6.24		0	0
Nitrogen Dioxide	0.18 ppm	--	1.57		0	--	1.36		0	--	1.37		0	--
Mojave Desert Air Basin														
Ozone-hourly	0.09 ppm	--	0.138		75	4	0.145		66	7	0.148		61	4
Ozone-8 hour	0.07 ppm	0.08	0.119		--	49	0.123		--	55	0.124		--	50
PM10	50 µg/m³	150 µg/m³	National 198.8	State 83.0	2	2	National 130.8	State 70.0	3	0	National 184.4	State 77.0	4	2
Carbon Monoxide	9 ppm	9 ppm	1.72		0	0	1.63		0	0	1.60		0	0
Nitrogen Dioxide	0.18 ppm	--	0.103		0	--	0.087		0	--	0.082		0	--
Salton Sea Air Basin														
Ozone-hourly	0.09 ppm	--	0.125		48	1	0.139		54	4	0.129		51	3
Ozone-8 hour	0.07 ppm	0.08	0.106		--	37	0.116		--	43	0.109		--	32
PM10	50 µg/m³	150 µg/m³	National 201.0	State 195.0	36	1	National 211.0	State 220.0	38	2	National 248.0	State 261.0	39	3
Carbon Monoxide	9 ppm	9 ppm	10.33		1	1	8.98		0	0	9.76		1	1
Nitrogen Dioxide	0.18 ppm	--	0.108		0	--	0.131		0	--	0.101		0	--
South Central Coast Air Basin														
Ozone-hourly	0.09 ppm	--	0.122		23	0	0.121		17	0	0.130		24	3
Ozone-8 hour	0.07 ppm	0.08	0.102		--	18	0.100		--	12	0.104		--	22
PM10	50 µg/m³	150 µg/m³	146.0		10	0	National 83.4	State 86.6	2	0	National 131.0	State 135.0	5	0
Carbon Monoxide	9 ppm	9 ppm	2.62		0	0	1.66		0	0	1.81		0	0
Nitrogen Dioxide	0.18 ppm	--	0.071		0	--	0.070		0	--	0.063		0	--

exhaust and may exist as particulate matter or as vapors (gases). Toxic air contaminants include metals, other particles, gases adsorbed on to 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. It is currently estimated that about one in four deaths in the U.S. is attributable to environmental pollution (Doll and Peto, 1981). The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods.

Greenhouse Gases

Global warming is the observed increase in average temperature of the earth's surface and atmosphere. The primary cause of global warming is an increase of greenhouse gases (GHGs) in the atmosphere. The six major GHGs are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), haloalkanes (HFCs), and perfluorocarbons (PFCs). GHGs absorb longwave radiant energy emitted by the earth, which warms the atmosphere. The GHGs also emit longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation emitted by the atmosphere is known as the "greenhouse effect."

The current scientific consensus is that the majority of the observed warming over the last 50 years can be attributable to increased concentration of GHGs in the atmosphere due to human activities. Events and activities, such as the industrial revolution and the increased consumption of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. As reported by the California Energy Commission (CEC), California contributes 1.4 percent of the global and 6.2 percent of the national GHGs emissions (CEC, 2004). The World Resources Institute's GHG Protocol Initiative, the U.S. EPA, and the State of California all identify six GHGs generated by human activity that are believed to be contributors to global warming:

- Carbon dioxide (CO2)
- Methane (CH4)
- Nitrous oxide (N2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF6)

The different GHGs have varying global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. By convention, CO2 is assigned a GWP of 1. By comparison, CH4 has a GWP of 21, which means that it has a global warming effect 21 times greater than CO2 on an equal-mass basis. N2O has a GWP of 310, which means that it has a global warming effect 310 times greater than CO2 on an equal-mass basis. To account for their GWPs, GHG emissions are often reported as a CO2 equivalent (CO2e) in metric tonnes (an international measuring unit). The CO2e is calculated by multiplying the emission of each GHG by its GWP, and adding the results together to produce a single, combined emission rate representing all GHGs.

The California Air Resources Board (ARB) has developed a State GHG emissions inventory for years 1990 through 2004. In 2004, GHG emissions in the State were 496.95 million metric tonnes.[21,22] Transportation and energy industry sources accounted for the majority of these emissions. Transportation (i.e., civil aviation, road transportation, railways, and water-borne navigation) represented approximately 39 percent of total emissions and energy industries (e.g., electricity production, heat production, petroleum refining, and manufacturing of solid fuels) represented approximately 34 percent of total emissions. The other 27 percent of emissions come from various sources including, but not limited to, aviation, railways, and agriculture.

Existing GHG emissions for the SCAG region were calculated for construction sources[23], mobile sources[24], natural gas consumption[25], and electricity generation[26]. As shown in **Table 3.2-2**, existing SCAG emissions are estimated to be approximately 176.79 million metric tonnes of CO2e per year. Transportation and energy (i.e., electricity use and natural gas consumption) account for approximately 47 and 52 percent of emissions, respectively. Construction activity accounts for approximately one percent of emissions.

It is important to note a few limitations before comparing SCAG regional GHG emissions to the State emissions inventory prepared by ARB. First, 2004 is the latest year for which the ARB has estimated State emissions, and SCAG emissions are presented for 2008. However, the comparison provides a reasonable percentage estimate of State emissions that are generated in the SCAG region. Second, the ARB emissions inventory includes emission estimates from various sources that were not included in the SCAG analysis because every emission source analyzed by the ARB (e.g., mineral industry, livestock, manure management) could not be analyzed for the SCAG region due to methodological and data limitations. As a result, SCAG emissions are an underestimation when compared to the total State emissions.

With the above limitations in mind, the 176.79 million metric tonnes of CO2e per year calculated for the SCAG region represents approximately 36 percent of total State GHG emissions. A more meaningful comparison can be drawn by only analyzing emissions from construction, mobile, and energy sources. The State emissions inventory lists 338.06 million metric tonnes of CO2e per year from energy industries, road transportation, and construction. Compared to these emissions, the SCAG region generates approximately 52 percent of total state emissions.

Regulatory Settings

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

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21 ARB, *Draft California Greenhouse Gas Inventory Millions of Metric Tonnes of CO2 Equivalent – By IPCC Category*, August 22, 2007.

22 One metric tonne equals 1.1 tons.

23 Construction emissions were calculated using ARB's URBEMIS2007 Transportation and Land Use Emission Inventory Model.

24 Mobile source emissions were calculated using ARB's EMFAC2007 Motor Vehicle Emission Inventory Model and the California Climate Action Registry *General Reporting Protocol* (March 2007).

25 Natural gas emissions were calculated based on emission rates obtained from the California Climate Action Registry *General Reporting Protocol* (March 2007).

26 Electricity generation emissions were calculated indirectly as a function of regional electricity use. Emission rates obtained from the California Climate Action Registry *General Reporting Protocol* (March 2007).

TABLE 3.2-2
EXISTING GREENHOUSE GAS EMISSIONS [1]

Area and Source	Carbon Dioxide Equivalent (Million Metric Tonnes per Year) [2]
Imperial County	
Construction	0.04
Mobile	1.36
Electricity	0.59
Natural Gas	0.37
Total	2.36
Los Angeles County	
Construction	0.66
Mobile	42.28
Electricity	25.88
Natural Gas	24.38
Total	93.20
Orange County	
Construction	0.10
Mobile	13.2
Electricity	7.72
Natural Gas	8.65
Total	29.67
Riverside County	
Construction	0.46
Mobile	10.49
Electricity	5.15
Natural Gas	4.31
Total	20.41
San Bernardino County	
Construction	0.33
Mobile	13.13
Electricity	5.84
Natural Gas	4.29
Total	23.59
Ventura County	
Construction	0.09
Mobile	3.37
Electricity	2.13
Natural Gas	1.97
Total	7.56
SCAG Region	**176.79**
State of California	**496.95[3]**

NOTES:
1. The table does not include all sources of GHG emissions (e.g., industrial processes, agriculture, etc.).
2. One metric tonne equals 1.1 tons.
3. ARB, *Draft California Greenhouse Gas Inventory (Millions of Metric Tonnes of CO2 Equivalent – By IPCC Category*, August 22, 2007.

Criteria Pollutants

The Federal Clean Air Act (CAA) and the California Clean Air Act (CCAA) set forth comprehensive requirements for air pollution control. Based on the CAA and CCAA, health-based air quality standards have been established by the U.S. EPA and the State of California for the following criteria pollutants: ozone, CO, NO2, PM10, PM2.5, SO2, and lead. The State standards, which also include standards for sulfate and visibility, are more stringent than the federal standards. The California and National Ambient Air Quality Standards (NAAQS) are summarized in **Table 3.2-3**.

Table 3.2-3:
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		Federal Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O3)	1 Hour	0.09 ppm (180 µg/m³)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m³)		0.08 ppm (157 µg/m³)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mea	20 µg/m^3				
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m	Gravimetric or Beta Attenuation	15 µg/m		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (1 0mg/m³)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m³)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m³)		35 ppm (40 mg/m³)		
	8 Hour Lake Tahoe	6 ppm (7 mg/m^3)		—	—	—
Nitrogen Dioxide (NO2) *	Annual Arithmetic Mea	0.030 ppm (56 µg/m3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m³)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (338 µg/m³)		—		
Sulfur Dioxide (SO2)	Annual Arithmetic Mean	—	Ultraviolet Fluorescence	0.030 ppm (80 µg/m³)	—	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 µg/m³)		0.14 ppm (365 µg/m³)	—	
	3 Hour	—		—	0.5 ppm (1300 µg/m³)	
	1 Hour	0.25 ppm (655 µg/m³)		—	—	—
Lead[8]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
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	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3	Ultraviolet Fluorescence			
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

NOTES: The Nitrogen Dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, 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.
2. 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 PM10, 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 PM2.5, 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.
3. Contact U.S. EPA for further clarification and current federal policies.
4. 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.
5. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
6. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
7. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
8. Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.
9. 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.

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 EPA action. Each air district submits its respective AQMPs/SIPs to ARB. ARB is the official State agency that submits the SIPs to EPA for all federal non-attainment and maintenance areas in California.

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 or maintenance area for NO_2; CO; PM10; and PM2.5; 8-hour ozone.
- 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 –
  - Searles Valley (situated in the NW part of the county) is non-attainment for PM10.
  - San Bernardino County (excluding the Searles Valley area) within the MDAB is a non-attainment area for PM10.
- 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 PM10 and 8-hour ozone.
- The Imperial County Portion of SSAB - The entire Imperial County portion of SSAB is designated as non-attainment for 8-hour ozone and PM10.

The air districts in the SCAG region have recently or are developing attainment plans (AQMPs) to meet the federal 8-hour ozone standard. The 2007 AQMP for the SCAB included the attainment demonstration for PM2.5 (the SCAB is the only PM2.5 non-attainment area in the SCAG region). All areas of the SCAG region are in compliance with the federal PM10, CO, NO2, SO2, and lead standards.

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 NO2. 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 and provisions related to conformity SIPs are found in 40 CFR 51.390.

Conformity also requires all Transportation Control Measures (TCM) projects subject to reporting to be fully funded and on schedule. In the SCAG Region, there are two areas for which the ozone SIPS contain TCMs: SCAB and the Ventura County portion of SCCAB.

Toxic Air Contaminants

Toxic air contaminants (TAC) are regulated under both state and federal laws.

Federal Regulation

The 1970 Amendments to the CAA included a provision to address air toxics. Under Title III of the CAA, U.S. EPA 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 U.S. EPA to develop a list of sources that emit any of 189 HAPs, and to develop regulations for these categories of sources. To date, EPA has listed 174 categories and developed a schedule for the establishment of emission standards.[27] Rather than promulgating NESHAPs for each pollutant, the CAA directs U.S. EPA 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. U.S. EPA 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.

California Regulation

The ARB's statewide comprehensive air toxics program was established in the early 1980's. The Toxic Air Contaminant Identification and Control Act (AB 1807, Tanner 1983) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, Connelly 1987) supplements the AB 1807 program,

[27] U.S. Environmental Protection Agency, Office of Compliance, Office of Enforcement and Compliance Assurance, *EPA Office of Compliance Sector Notebook Project: Air Transportation Industry*, October 1998.

by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

Under AB 1807, the ARB is required to use certain criteria in the prioritization for the identification and control of air toxics. In selecting substances for review, the 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)]. AB 1807 also requires the ARB to use available information gathered from the AB 2588 program to include in the prioritization of compounds. This report includes available information on each of the above factors required under the mandates of the AB 1807 program. AB 1807 and AB 2588 are described in more detail below.

AB 1807 Program

In 1983, the California Legislature 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), the ARB and the Office of Environmental Health Hazard Assessment (OEHHA) determines if a substance should be formally identified as a TAC in California. During this process, the ARB and the OEHHA staff draft a report that serves as the basis for this determination. The ARB staff assesses the potential for human exposure to a substance and the OEHHA staff evaluates the health effects. After the ARB 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 review the report for its scientific accuracy. If the SRP approves the report, they develop specific scientific findings which are officially submitted to the ARB. The 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 Board will decide whether to identify a substance as a TAC.

In the second step (risk management), the 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.

In 1993, the California Legislature amended the AB 1807 program for the identification and control of TACs (AB 2728). Specifically, AB 2728 required the ARB to identify the 189 federal hazardous air pollutants as TACs. For those substances that have not previously been identified under AB 1807 and identified under AB 2728, health effects values will need to be developed. This report will serve as a basis for that evaluation. For substances that were not identified as TACs and are on the TAC Identification List, this report will provide information to evaluate which substances may be entered into the air toxics identification process.

AB 2588 "Hot Spots" Program

In September 1987, the California Legislature established the AB 2588 air toxics "Hot Spots" program. It requires facilities to report their air toxics emissions, ascertain health risks, and to

notify nearby residents of significant risks. The emissions inventory and risk assessment information from this program has been incorporated into this report. In September 1992, the "Hot Spots" Act was amended by Senate Bill 1731 which required 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.

Greenhouse Gases

Currently, there are no federal standards for GHGs emissions. Recently, however, the U.S. Supreme Court ruled that the harms associated with climate change are serious and well recognized, that the U.S. EPA must regulate GHGs as pollutants, and unless the agency determines that GHGs do not contribute to climate change, it must promulgate regulations for GHG emissions from new motor vehicles (Massachusetts et al. vs. Environmental Protection Agency [case No. 05-1120], April 2, 2007). However, no federal regulations have been set at this time.

Currently, control of GHGs is generally regulated at the state level and approached by setting emission reduction targets for existing sources of GHGs, setting policies to promote renewable energy and increase energy efficiency, and developing statewide action plans. To date, 12 states, including California, have set state GHG emission targets. Pertinent California regulation is summarized below.

AB 1493 - Vehicular Emissions of Greenhouse Gases

California Assembly Bill 1493 (Pavley), enacted on July 22, 2002, required ARB to develop and adopt regulations that reduce greenhouse gases emitted by passenger vehicles and light duty trucks. Regulations adopted by ARB will apply to 2009 and later model year vehicles. ARB

estimates that the regulation will reduce climate change emissions from light duty passenger vehicle fleet by 18 percent in 2020 and 27 percent in 2030 (CARB 2004).

Executive Order S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005 through Executive Order S-3-05, state-wide GHG emission reduction targets as follows: 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 (CA 2005). Some literature equates these reductions to 11 percent by 2010 and 25 percent by 2020.

AB 32 - California Global Warming Solutions Act of 2006

The purpose of AB 32 is to reduce statewide GHG emissions to 1990 levels by 2020. This enactment instructs the ARB to adopt regulations that reduce emissions from significant sources of GHGs and establish a mandatory GHG reporting and verification program by January 1, 2008. AB 32 requires the ARB to adopt GHG emission limits and emission reduction measures by January 1, 2011, both of which are to become effective on January 1, 2012. The ARB must also evaluate whether to establish a market-based cap and trade system. AB32 does not identify a significance level of GHG for CEQA/NEPA purposes, nor has the ARB adopted such a significance threshold. On December 6, 2007, ARB adopted 427 million metric tonnes of carbon dioxide equivalent (MMTCO2e) as the total statewide aggregated greenhouse gas 1990 emissions level and the 2020 emissions limit.

Executive Order S-01-07

Executive Order S-01-07 was enacted by the Governor on January 18, 2007. Essentially, the order mandates: 1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020; and 2) that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California.

Methodology

This section summarizes the methodology used to evaluate the potential air quality impacts of the proposed Plan.

The analysis evaluates the potential impacts of the RTP relative to: 1) criteria pollutants; 2) toxic air contaminants resulting from on-road mobile sources in the region; and 3) greenhouse gas emissions. The focus of the analysis is on-road mobile emissions, but as discussed below, stationary and other emissions are briefly summarized for purposes of comparison.

Criteria Pollutants

Regional mobile source emissions are based on an analytical process, which involves a computer-simulated forecast of emissions from the 2008 RTP out to year 2035. Concurrent with the RTP and this PEIR, air quality conformity analyses for mobile (on-road) emissions are being undertaken. In general, the same modeling methodologies were used in the preparation of the

PEIR analysis and the conformity analysis. Federal conformity regulations require emissions to be based on the latest planning assumptions in force at the time of the conformity determination. The latest planning assumptions must be derived from the population, employment, travel, and congestion estimates that have been most recently developed. Examples of assumptions are land use, vehicle age and fleet mix, and the most recent information regarding the implementation of control measures in approved State Implementation Plans (e.g., inspection and maintenance (I/M) and fuels programs, transportation control measures). Emission budgets for mobile source emissions are established for all relevant criteria pollutants for each Federal nonattainment area to ensure continued regional compliance with the Clean Air Act.

Mobile source emissions are a product of mobile source emission factors and vehicle activity data. The mobile source emission factors are based on the latest version of the ARB mobile source emissions inventory model, EMFAC2007. The emission factors accommodate certain performance assumptions including fuel efficiency, emissions control technologies and deterioration of control systems, and mobility assumptions (e.g., vehicle speed and idling). Vehicle miles traveled (VMT) are predicted by the SCAG travel demand model. Projected vehicle emissions expected from the Southern California transportation network in 2035 under the Plan were compared with those estimated for current (2008) conditions.

SCAG is responsible for ensuring that mobile emissions do not exceed the emission budgets. All other sources of emissions (e.g., stationary sources, ships, airplanes, trains, construction) are the responsibility of local air districts, the Air Resources Board, or the Environmental Protection Agency. These emissions are addressed in local Air Quality Management Plans and associated environmental documents. For purposes of comparison, this EIR provides a summary of the SCAQMP emissions anticipated from these sources (for purposes of this PEIR the horizon year was extrapolated to 2035 using a straight line projection based on trend data).

The projections for stationary and other sources were prepared based on SCAG projections, but at the time the full effect of the growth policies contained within the RTP had not been included. Nonetheless, it is believed that the extrapolated AQMP projections to the 2035 RTP horizon year provide a reasonable estimate of 2035 emissions. Total growth projections for employment, population and households were not affected by the growth policies, only the distributions were affected. In addition, by 2035 it is anticipated that many factors will have changed (reduced dependence on oil and/or reduced availability of oil) such that emissions will be substantially different from those contained in this PEIR. However, for purposes of comparison in 2035, the straight-line projection method of increasing emissions from horizon year data was considered appropriate for a meaningful PEIR analysis.

Short-term construction impacts on localized air quality are briefly discussed. These impacts result from construction activities (of both Plan projects and associated growth) which include construction equipment emissions, dust from grading and earthmoving operations, and emissions from workers' vehicles traveling to and from construction sites. Quantification of these emissions is undertaken within the AQMP, and is included within the stationary and area source emissions summarized and extrapolated from the SCAQMD's 2007 AQMP.

Toxic Air Contaminants

The quantification of changes in cancer risk impacts resulting from vehicle operation in the vicinity of each of the selected freeway corridors in the 2008 RTP was performed using an EPA-approved pollutant dispersion model in conformance with SCAQMD diesel exhaust risk assessment procedures.[28] Guidance published by OEHHA was used in the design of the scope of analysis.[29] Based on the OEHHA guidance, the analyses of health effect impacts were limited to evaluations of changes in cancer risks from the inhalation pathway. The OEHHA procedures state that "the potential cancer risk from inhalation exposure to diesel PM will outweigh the potential non-cancer health impacts" and that "potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multipathway cancer risk from the speciated compounds." As clarified in this reference, "the surrogate for whole diesel exhaust is diesel PM." On the basis of these statements, the assessments of risk associated with diesel exhaust emissions from operation of freeway segments conducted here were limited to the cancer impacts from the inhalation route only. Because diesel exhaust PM emissions contribute roughly 90% of airborne cancer exposure from on-road vehicle use, as confirmed by Table 4, the evaluation of changes in cancer risk impacts from exposure to the gasoline exhaust toxic pollutants was also limited to the inhalation pathway.

Greenhouse Gas Emissions

Greenhouse gas emissions were estimated using the EMFAC 2007 model for mobile sources, the UBEMIS2007 model for construction emissions, and indirectly for stationary sources using estimates of electricity and natural gas use and associated emission rates of CO2 from the California Climate Action Registry (see Appendix B for a more detailed discussion of this methodology).

Comparison with the No Project

The analysis of air quality 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; however, it provides a meaningful perspective on the expected effects and benefits of the 2008 RTP.

Determination of Significance

The methodology for determining significance applies the significance criteria below to compare the expected future conditions with the Plan to existing conditions (2008).

[28] Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions, South Coast Air Quality Management District, December 2002, *http:/www/aqmd.gov/handbook/hra_guide.doc*.

[29] Appendix D: Risk Assessment Procedures to Evaluate Particulate Emissions from Diesel-Fueled Engines, Air Toxic Hot Spots Program Risk Assessment Guidelines, California Office of Environmental Health Hazard Assessment, October 2003; *http://www.oehha.ca.gov/air/hot_spots/pdf/HRAfinalapps.pdf*.

Significance Criteria

For purposes of this regional analysis, the following criteria for determining significance have been applied:

- Projected long-term emissions of criteria pollutants are considered significant if they are substantially greater than current emission levels.
- Projected short-term emissions (construction) are considered to be significant if potential RTP projects would exceed the thresholds established by the local air districts (see Table 3.2-11).
- Projected long-term emissions of toxic air contaminants (diesel particulate matter from heavy-duty diesel trucks) are considered significant if they are equal to or 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 exceed existing conditions.
- 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.
- For purposes of this PEIR, any increase in Greenhouse Gas (GHG) emissions compared to 2008 is considered significant.

Impacts and Mitigation Measures

Analysis of the potential air quality impacts of the 2008 RTP was conducted based on detailed modeling of on-road sources; regional emissions from stationary and other sources are summarized from the SCAQMP and associated EIR. A screening level Health Risk Assessment was conducted for the 2008 PEIR in accordance with SCAQMD, ARB and USEPA guidelines. Because Plan and cumulative emissions are interrelated, cumulative emissions are discussed together with Plan emissions.

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.

On-going and subsequent planning work being pursued by SCAG will comprehensively address climate change. This work will design approaches to achieve defined sustainability targets. In addition SCAG, as part of its air quality planning responsibilities, is currently preparing a white paper on future air quality attainment strategies that will expand the range of measures available to control pollutants.

Impact 3.2-1: Under the Plan, long-term emissions of PM10 and PM2.5 would increase substantially, when compared to existing conditions (2008). PM10 would increase in the

SCAB, San Bernardino portion of MDAB and Imperial County portion of SSAB, and PM2.5 emissions would increase in the SCAB; PM10 would increase in Los Angeles, Orange, Riverside and San Bernardino Counties, PM2.5 would increase in Los Angeles and Riverside Counties, as a result of on-road mobile sources. The increase in regional emissions of PM10 and PM2.5 would be considered a significant cumulative impact. Emissions of ROG, NOx, CO, and SOx would decrease when compared to 2008; this would be a beneficial impact.

Direct, long-term impacts were assessed and are described in detail below. Projected long-term emissions of criteria pollutants are considered significant if they are substantially greater than the current emission levels (2008 base year).

Criteria Pollutant Emissions Analysis

To assess the effectiveness of the improvements proposed in the 2008 RTP, estimated air emissions for the year 2035 under the Plan were compared with the 2008 conditions. The calculated emissions were compiled for each non-attainment area and county in the SCAG region.

2008 RTP Compared to Current Conditions

Table 3.2-4 summarizes emissions by nonattainment areas in the region. Under the Plan, emissions of ROG, NOx, and CO would decrease, when compared to 2008. SOx would remain approximately the same as 2008. These reductions are considered a **beneficial** impact. Under the 2008 RTP, all nonattainment areas would experience reduced levels of criteria pollutants except PM10 and PM2.5. However, PM10 and PM2.5 would increase in the SCAB (13 percent and 11 percent respectively). PM10 would increase in the San Bernardino County portion of the MDAB (50 percent) and Imperial County portion of SSAB (40 percent). The increase in PM10 is associated with increased re-entrained road dust. Tailpipe emissions of PM10 and PM2.5 decrease between 2008 and 2035.

Table 3.2-5 summarizes the current and projected criteria pollutant emissions estimated for the 2008 RTP as compared to the current conditions by county. As shown in Table 3.2-5, under the Plan emissions of ozone precursors, NOx and ROG, would experience a dramatic improvement over existing conditions. However PM10 and PM2.5 would increase in Los Angeles (6 percent and 10 percent) and Riverside (41 percent and 33 percent) counties, and PM10 would increase in Orange (8 percent) and San Bernardino (17 percent) Counties.

2008 RTP Compared to No Project

In addition to comparing the impacts of the RTP to existing conditions, the analysis 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; however, it provides a meaningful perspective on the expected effects and benefits of the 2008 RTP.

Table 3.2-6 summarizes the differences between No Project and Plan projected criteria pollutant emissions estimated for the 2008 RTP by nonattainment area. When compared to the No Project condition emissions, the 2008 RTP would result in less or equivalent emissions. **Table 3.2-7** summarizes the differences between No Project and Plan projected criteria pollutant emissions estimated for the 2008 RTP by county. When compared to the No Project emissions, the 2008 RTP would result in fewer or the same emissions of all criteria pollutants for all six counties in the SCAG region.

Table 3.2-7 summarizes the differences between No Project and Plan projected criteria pollutant emissions estimated for the 2008 RTP by county. When compared to the No Project emissions, the 2008 RTP would result in fewer emissions of all criteria pollutants (with the exception of SOx which would be the same in Imperial and Ventura under Plan and No Project conditions) for all six counties.

Mitigation Measures

Emissions of particulate matter are directly related to growth and VMT. Regardless of how clean a vehicle operates, the vast majority of PM10 and PM2.5 emissions from on-road sources are generated from re-entrained dust on paved roads and is a function of VMT. Mitigation measures that reduce VMT are proposed. Additional measures to control fugitive dust and transportation-related PM10 and PM2.5 are outlined in the SCAQMD 2007 Air Quality Management Plan (AQMP) and include control methods, such as watering, chemical stabilization, paving, revegetation, track-out control, construction project signage, sweeping and motor vehicle controls. Mitigation measures are hereby incorporated by reference from the following air quality management plans:

- 2007 South Coast Air Quality Management Plan (AQMP)[30]

  South Coast Air Quality Management District Mitigation Measures and Control Efficiencies for the following:[31]

  - Off-road Engines
  - On-road Engines
  - Harbor Craft
  - Ocean-going Vessels
  - Locomotives
  - Fugitive Dust
- Mojave Desert Air Quality Management Plan
- Antelope Valley Air Quality Management Plan
- Imperial County Air Quality Management Plan

30 Source: http://www.aqmd.gov/aqmp/AQMPintro.htm.

31 Source: http://www.aqmd.gov/ceqa/handbook/mitigation/MM_intro.html.

TABLE 3.2-4
CRITERIA POLLUTANT EMISSIONS BY NONATTAINMENT AREA – 2008 VS 2035 PLAN (IN TONS PER DAY)

Nonattainment Area		ROG Summer	ROG Annual	NOx Summer	NOx Annual	NOx Winter	CO Winter	PM10 Annual	PM2.5 Annual	SOx Annual
SCAB	*Existing*	201		420			1907	120	18	2
	Plan	76		113			563	135	20	2
	Difference	-125		-307			-1344	15	2	0
	% Difference	-62%		-73%			-70%	**13%**	**11%**	0%
Coachella Portion of SSAB	*Existing*	8		37				3	0	0
	Plan	3		11				3	1	0
	Difference	-4		-26				0	1	0
	% Difference	-55%		-70%				0%	0%	0%
Ventura County Portion of SCCAB	*Existing*	12		17						
	Plan	4		5						
	Difference	-7		-12						
	% Difference	-63%		-71%						
Western MDAB	*Existing*	21		69						
	Plan	8		23						
	Difference	-13		-46						
	% Difference	-62%		-67%						
San Bernardino County Portion of MDAB	*Existing*		16		83			4		
	Plan		6		24			6		
	Difference		-10		-59			2		
	% Difference		-63%		-71%			**50%**		
Imperial County Portion of SSAB	*Existing*	6		18				5		
	Plan	4		8				7		
	Difference	-2		-10				2		
	% Difference	-38%		-56%				**40%**		

TABLE 3.2-5
CRITERIA POLLUTANT EMISSIONS BY COUNTY – 2008 VS 2035 PLAN (IN TONS PER DAY)

County		ROG Summer	ROG Annual	NOx Summer	NOx Annual	NOx Winter	CO Winter	PM10 Annual	PM2.5 Annual	SOx Annual
Los Angeles	*Existing*	117	117	240	247	266	1,132	68	10	1
	Plan	40	40	59	60	63	310	71	11	1
	Difference	-77	-77	-181	-187	-203	-822	3	1	0
	% Difference	-66%	-66%	-75%	-76%	-76%	-73%	**4%**	**10%**	0%
Imperial	*Existing*	6	5	18	17	18	47			0
	Plan	4	3	8	8	8	28			0
	Difference	-2	-2	-10	-9	-10	-19			0
	% Difference	-33%	-40%	-56%	-53%	-56%	-40%			0%
Orange	*Existing*	38	38	67	68	74	370	24	4	0
	Plan	15	15	18	18	19	107	26	4	0
	Difference	-23	-23	-49	-50	-55	-263	2	0	0
	% Difference	-61%	-61%	-73%	-74%	-74%	-71%	**8%**	0%	0%
Riverside	*Existing*	32	30	105	103	110	281	17	3	0
	Plan	15	14	33	32	34	109	24	4	0
	Difference	-17	-16	-72	-71	-76	-172	7	1	0
	% Difference	-53%	-53%	-69%	-69%	-69%	-61%	**41%**	**33%**	0%
San Bernardino	*Existing*	40	37	142	143	150	378	12	2	0
	Plan	16	15	44	43	44	133	14	2	0
	Difference	-24	-22	-98	-100	-106	-245	2	0	0
	% Difference	-60%	-59%	-70%	-70%	-71%	-65%	**17%**	0%	0%
Ventura	*Existing*	12	12	19	20	22	106			0
	Plan	4	4	5	5	5	30			0
	Difference	-8	-8	-14	-15	-17	-76			0
	% Difference	-67%	-67%	-74%	-75%	-77%	-72%			0%

Los Angeles County excludes Antelope Valley
Riverside County includes the SCAB, MDAB, and Coachella Valley portions
San Bernardino County includes the SCAB and MDAB portions

TABLE 3.2-6
CRITERIA POLLUTANT EMISSIONS BY NONATTAINMENT AREA – 2035 NO PROJECT VS 2035 PLAN (IN TONS PER DAY)

Nonattainment Area		ROG Summer	ROG Annual	NOx Summer	NOx Annual	NOx Winter	CO Winter	PM10 Annual	PM2.5 Annual	SOx Annual
SCAB	*No Project*	77		116			572	135	20	3
	Plan	76		113			563	135	20	2
	Difference	-1		-3			-9	0	0	-1
	% Difference	-1%		-3%			-2%	0%	0%	-33%
Coachella Portion of SSAB	*No Project*	4		11				4	1	0
	Plan	3		11				3	1	0
	Difference	-1		0				-1	0	0
	% Difference	-25%		0%				-25%	0%	0%
Ventura County Portion of SCCAB	*No Project*	4		5						
	Plan	4		5						
	Difference	0%		0						
	% Difference	0%		0%						
Western MDAB	*No Project*	8		21						
	Plan	8		23						
	Difference	0		2						
	% Difference	0%		**10%**						
San Bernardino County Portion of MDAB	*No Project*		6		26			7		
	Plan		6		24			6		
	Difference		0		-2			-1		
	% Difference		0%		-8%			-14%		
Imperial County Portion of SSAB	*No Project*	4		9				8		
	Plan	4		8				7		
	Difference	0		-1				-1		
	% Difference	0%		-11%				-13%		

TABLE 3.2-7
CRITERIA POLLUTANT EMISSIONS BY COUNTY – 2035 NO PROJECT VS 2035 PLAN (IN TONS PER DAY)

County		ROG Summer	ROG Annual	NOx Summer	NOx Annual	NOx Winter	CO Winter	PM10 Annual	PM2.5 Annual	SOx Annual
Los Angeles	*No Project*	41	40	60	61	64	313	71	11	1
	Plan	40	40	59	60	63	310	71	11	1
	Difference	-1	0	-1	-1	-1	-3	0	0	0
	% Difference	-2%	0%	-2%	-2%	-2%	-1%	0%	0%	0%
Imperial	*No Project*	4	3	9	8	8	28			0
	Plan	4	3	8	8	8	28			0
	Difference	0	0	-1	0	0	0			0
	% Difference	0%	0%	-11%	0%	0%	0%			0%
Orange	*No Project*	15	15	18	18	19	108	26	4	0
	Plan	15	15	18	18	19	107	26	4	0
	Difference	0	0	0	0	0	-1	0	0	0
	% Difference	0%	0%	0%	0%	0%	-1%	0%	0%	0%
Riverside	*No Project*	16	14	34	34	35	115	23	4	0
	Plan	15	14	33	32	34	109	24	4	0
	Difference	-1	0	-1	-2	-1	-6	1	0	0
	% Difference	-6%	0%	-3%	-6%	-3%	-5%	**4%**	0%	0%
San Bernardino	*No Project*	17	16	47	47	48	141	14	2	1
	Plan	16	15	44	43	44	133	14	2	1
	Difference	-1	-1	-3	-4	-4	-8	0	0	0
	% Difference	-6%	-6%	-6%	-9%	-8%	-6%	0%	0%	0%
Ventura	*No Project*	4	4	5	5	5	30			0
	Plan	4	4	5	5	5	30			0
	Difference	0	0	0	0	0	0			0
	% Difference	0%	0%	0%	0%	0%	0%			0%

Los Angeles County excludes Antelope Valley
Riverside County includes the SCAB, MDAB, and Coachella Valley portions
San Bernardino County includes the SCAB and MDAB portions

MM-AQ.1: Pursuant to CAA Section 108(f)(1)(A), Transportation Control Measures (TCMs) from the 2007 AQMP include the following sixteen measures:

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 2008 RTP has been prepared to facilitate implementation of the transportation control measures outlined in the 2007 AQMP. The 2008 RTP incorporates both the capital and noncapital improvements recommended by the AQMP.

MM-AQ.2: ARB has adopted a series of measures designed to attain federal air quality standards for PM2.5 and 8-hour ozone. ARB's strategy, outlined in the South Coast SIP, 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[32]:

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

32 California Air Resources Board. April 26, 2007. *Proposed New SIP Measures – Descriptions.* Retrieved on December 2007 from http://www.arb.ca.gov/planning/sip/2007sip/apr07draft/sipmeas.pdf,

Significance after Mitigation

Even with implementation of all feasible mitigation measures and incorporation of measures as described above, regional emissions of PM10 and PM2.5 would increase substantially in the region. Therefore, the project would have a **significant and unavoidable impact** on regional air quality. It must be noted, however, that the State Implementation Plans for the region account for the increased fugitive dust (as well as tail pipe emissions) such that the RTP conforms to the attainment demonstrations as required by the federal CAA.

Impact 3.2-2: Long-term (operational) localized impacts resulting from freeway operations under the Plan would be reduced compared to today but would likely continue to exceed the project specific cancer risk threshold of one in one million. The cumulative impact is beneficial. The continuation of a pre-existing problem is not an impact of the plan or cumulative development.

Toxic air contaminants (TACs) include airborne substances other than the criteria pollutants that are known to cause cancer or otherwise harm human health. TAC emissions are also regulated by the local air quality management districts. Much of the effort toward controlling TACs has concentrated on point source emissions from businesses handling hazardous materials. However, mobile sources are responsible for approximately half of the total lifetime cancer risk attributed to air toxics. **Table 3.2-8** summarizes PM10 emissions from heavy-duty truck vehicle exhaust by county. Heavy-duty truck PM10 exhaust emissions include most of the diesel-related TAC emissions. As shown in the table, PM10 emissions from heavy-duty trucks would be expected to decrease from 2008 levels for each county. As a result of the anticipated decline in TAC emissions, the 2008 RTP would potentially have a **beneficial** impact with respect to regional TAC emissions.

TABLE 3.2-8
PM10 EMISSIONS EXHAUST ONLY FOR HEAVY-DUTY TRUCKS PER COUNTY (TONS PER DAY)

Scenario	Los Angeles	Imperial	Orange	Riverside	San Bernardino	Ventura
2008 Existing	5.24	0.56	1.00	3.26	4.75	0.30
2035 No Project	2.09	0.27	0.51	1.38	2.22	0.16
2035 Plan	2.03	0.27	0.50	1.37	2.05	0.16

Los Angeles including Antelope Valley
Riverside County includes SCAB and MDAB portions of Riverside and the SSAB - Coachella Valley Portion)
San Bernardino County includes SCAB and MDAB portions of San Bernardino
Note: PM Exhaust includes engine exhaust, including running, idle, and start exhaust

Localized impacts are addressed for the operational phase of the 2008 RTP. Mobile sources are sources of carcinogenic pollutants and are responsible for diesel exhaust. Areas near roadways typically register elevated concentrations of air toxics, and these areas are known as “hot spots.” Exposure to such “hot spots” may lead to adverse health effects. The proximity to roadways is an important factor in assessing exposure. Typically, concentrations drop off dramatically (around 90 percent) after the first quarter mile from the roadway.

Currently, there is a wide range of variability of concentrations throughout the SCAG region. The highest pollutant concentrations are found at the Ports, LAX, and along major corridors. The cancer risk in many of these areas is greater than the local air districts' acceptable risk of one in a million. To determine the health impacts to the general public living near sections of freeway that would be affected under the 2008 RTP, a screening risk assessment was conducted to estimate increased cancer risks in areas near a sample of projects. The results indicate that cancer risk resulting from operation of freeway sections would be reduced compared to today but would likely continue to exceed the acceptable threshold of one in a million at locations close to freeways. This impact would be considered **less than significant**. The analysis indicates that cancer risk levels in 2035 with implementation of the 2008 RTP would be substantially lower than cancer risk in 2008, primarily as a result of improvements in motor vehicle exhaust controls. The analysis also indicates that risk levels in 2035 without the 2008 RTP (the No Project) would be slightly higher than with the 2008 RTP. For the analysis of freeway segment operations, the cancer risk values reported by the model represent the increased chance of contracting cancer from exposure to freeway emissions if a person lived at the same location for a period of 70 years and if freeway emissions did not change over the 70 years from forecasted levels. The risk values reported at the maximum exposed residence by model runs for 2008, No Project and Plan for each of the six freeway segments studied are presented in **Table 3.2-9**. The maximum exposed residences identified from the modeling results were typically those found closest to the freeway segments. Analysis of modeling results also revealed that cancer risks declined dramatically with increasing distance away from the freeways. The distances at which estimated cancer risks drop by 50 percent and 90 percent are presented in **Table 3.2-10**.

Mitigation Measures

See mitigation measures for Impact 3.2-1.

Significance after Mitigation

Although toxic air contaminant concentrations at sensitive receptors located closest to regional freeways would remain above acceptable levels they would be significantly reduced compared to today, therefore the impact of the 2008 RTP and cumulative development would be **less than significant**.

TABLE 3.2-9
INCREASED CANCER RISK AT MAXIMUM EXPOSED RESIDENCE FROM VEHICLE OPERATION BY PLANNING SCENARIO AND FREEWAY CORRIDOR

	Increased Cancer Risk over 70-Year Exposure (per million)					
Planning Scenario	**I-405 (Orange)**	**I-710 (Los Angeles)**	**I-8 (Imperial)**	**SR 60 (San Bernardino)**	**SR 91 (Riverside)**	**US 101 (Ventura)**
2008 Existing	915	563	85	174	479	160
2035 No project	225	206	27	57	120	55
2035 Plan	222	174	24	51	108	54

SOURCE: Southern California Association of Governments, 2007

TABLE 3.2-10
DISTANCES AT WHICH CANCER RISKS DROP BY 50% AND 90%

Freeway Corridor	50% Reduction Distance	90% Reduction Distance
I-405 (Orange County)	330 ft.	1,440 ft.
I-710 (Los Angeles County)	330 ft.	1,080 ft.
I-8 (Imperial County)	280 ft.	1,990 ft.
SR 60 (San Bernardino County)	415 ft.	1,090 ft.
SR 91 (Riverside County)	220 ft.	590 ft.
US 101 (Ventura County)	440 ft.	1,415 ft.

SOURCE: Southern California Association of Governments, 2007

Impact 3.2-3: Emissions of short-term criteria pollutants would increase under the Plan as a result of construction of Plan projects and associated development in the region.

The 2008 RTP would involve substantial construction to implement the proposed Plan projects. In addition, construction of the development projects that comprise 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 (see **Table 3.2-16**, Stationary and Area Source Emissions for SCAB emissions).

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 US EPA'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 large number of the projects in the 2008 RTP would involve construction activities (new goods movement capacity enhancements, arterials, 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 2008 RTP are expected to be **significant**. The AQMD has developed thresholds of significance for individual construction projects within their jurisdiction as follows (see **Table 3.2-12)**:

TABLE 3.2-11
SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS FOR CONSTRUCTION[33]

	Mass Daily Thresholds[a]
Pollutant	Construction [b]
NOx	100 lbs/day
VOC	75 lbs/day
PM10	150 lbs/day
PM2.5	55 lbs/day
SOx	150 lbs/day
CO	550 lbs/day
Lead	3 lbs/day

a SOURCE: SCAQMD CEQA Handbook (AQMD, 1993)
b Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).
Key: lbs/day = pounds per day $\mu g/m^3$ = microgram per cubic meter
ppm = parts per million greater than or equal to

These thresholds are established in the 1993 *CEQA Air Quality Handbook* prepared by the AQMD. Other air 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 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 2008 RTP due to construction of transportation-related projects would create a **significant** impact.

Mitigation Measures

Mitigation measures include the mitigation measures included in Impact 3.2-1. Also, compliance with SCAQMD Rule 403 (Fugitive Dust) will reduce emissions of fugitive dust from construction activities.[34]

In addition, the following air quality mitigation measures sets forth a program of air pollution control strategies designed to reduce the project's air quality impacts from construction activities.

Land Clearing/Earth-Moving:

MM–AQ.3: Apply water or dust suppressants to exposed earth surfaces to control emissions.

33 Source: http://www.aqmd.gov/ceqa/handbook/signthres.doc.
34 Source: http://www.aqmd.gov/rules/siprules/sr403.pdf.

MM-AQ.4: All excavating and grading activities shall cease during second stage smog alerts and periods of high winds.

MM-AQ-5: All trucks hauling dirt, sand, soil, or other loose materials off-site shall be covered or wetted or shall maintain at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer).

Paved Surfaces:

MM-AQ.6: All construction roads that have high traffic volumes, shall be surfaced with base material or decomposed granite, or shall be paved or otherwise be stabilized.

MM-AQ.7: Public streets shall 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-AQ.8: Construction equipment shall be visually inspected prior to leaving the site and loose dirt shall be washed off with wheel washers as necessary.

Unpaved Surfaces:

MM-AQ.9: Water or non-toxic soil stabilizers shall be applied as needed to reduce off-site transport of fugitive dust from all unpaved staging areas and other unpaved surfaces.

MM-AQ.10: Traffic speeds on all unpaved surfaces shall not exceed 25 mph.

Other Construction Mitigation Measures

MM-AQ.11: Low sulfur or other alternative fuels shall be used in construction equipment where feasible.

MM-AQ.12: Deliveries related to construction activities that affect traffic flow shall 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 shall be provided to improve traffic flow (e.g., flag person).

MM-AQ.13: To the extent possible, construction activity shall utilize electricity from power poles rather than temporary diesel power generators and/or gasoline power generators.

MM-AQ.14: Revegetate exposed earth surfaces following construction.

Significance after Mitigation

After implementation of all feasible mitigation measures and incorporation of project features as described above, activities related to construction of RTP Plan projects, as well as associated regional growth would exceed construction emission thresholds for regional NOx, CO, PM10,

SO2, and ROG. Therefore, construction of the 2008 RTP projects and associated growth would have a **significant** and unavoidable impact on regional air quality.

Cumulative Impact 3.2-4: Cumulative development would result in on-road emissions discussed in previous impacts as well as train, airplane, ship and stationary and area sources of emissions. All emissions are anticipated to be consistent with applicable AQMPs and SIPs and on-road emissions within regional conformity emission budgets. Thus, consistency with applicable plans would be a less than significant impact. Nonetheless, such cumulative increases in emissions would be significant.

The regional cumulative analysis assessed the impacts of the 2008 RTP, including consideration of 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 2008 RTP development process, provide reasonable analysis of cumulative air quality impacts of the Plan. The RTP should conform to the emissions budgets established in each applicable SIP/AQMP. Federal conformity regulations require emissions to be based on the Latest Planning Assumptions which 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 2008 RTP and compares them to the emission budgets identified in the AQMPs/SIPs. If the estimated emissions from the 2008 RTP 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

conformity analysis is prepared separately from this PEIR and can be found in Appendices of the 2008 RTP. 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 and 2035 emissions (based on data contained in the 2007 AQMP and associated EIR for the year 2030 extrapolated to 2035) for the following emission sources in SCAB (which represents about 70% 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 RTP projects (**Table 3.2-16**).

Forecasts of emissions for trains and aircraft were obtained from the 2007 SCAQMP.[35] According to documentation on the SCAQMD website[36] the train emission estimates reflect projected emission reductions from the 1998 South Coast MOU and the 2005 CARB/Railroad MOU with two major locomotive operators. The demographic forecasts (i.e., population, housing employment by industry, etc.) used to project growth were developed by SCAG for the 2007 AQMP for 2002, 2005 and five year increments to 2030.

The aircraft emissions are based on operations at 48 airports located within the South Coast District boundaries. The FAA's Emissions and Dispersion Modeling System (EDMS) was used to calculate the emissions from commercial aircraft. Weighted generic emission factors were combined with landing and take off activity data to estimate emissions for general aviation military and air taxi operations where aircraft specific data was not readily available. SCAG's airport specific projections of million air passengers (MAP) were used to support estimates of emission inventories in 2010, 2020 and 2030.

[35] Final 2007 AQMP, Appendix III, Base and Future Year Emission Inventories, June 2007.
[36] http:/www.aqmd.gov/aqmp/07aqmp/draftfinal/chapter03.pdf.

TABLE 3.2-12
FINAL 2007 AQMP FORECAST OF ANNUAL AVERAGE TRAIN EMISSIONS IN THE SOUTH COAST AIR BASIN (TONS/DAY)

Year	TOG	VOC	CO	NOx	SOx	TSP	PM_{10}	$PM_{2.5}$
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*	3.58	2.99	13.73	37.19	0.03	0.99	1.00	0.91

* Calculated based on the annualized rate of change observed between 2023 and 2030.

TABLE 3.2-13
FINAL 2007 AQMP FORECAST OF ANNUAL AVERAGE AIRCRAFT EMISSIONS IN THE SOUTH COAST AIR BASIN (TONS/DAY)

Year	TOG	VOC	CO	NOx	SOx	TSP	PM_{10}	$PM_{2.5}$
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*	20.13	17.98	108.80	41.01	3.64	1.53	1.44	1.40

* Calculated based on the annualized rate of change observed between 2023 and 2030.

TABLE 3.2-14
FINAL 2007 AQMP FORECAST OF ANNUAL AVERAGE SHIP AND COMMERCIAL BOAT EMISSIONS IN THE SOUTH COAST AIR BASIN (TONS/DAY)

Year	TOG	VOC	CO	NOx	SOx	TSP	PM_{10}	$PM_{2.5}$
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*	7.17	5.99	20.32	185.17	64.10	10.56	10.17	9.88

* Calculated based on the annualized rate of change observed between 2023 and 2030.

TABLE 3.2-15
FINAL 2007 AQMP FORECAST OF ANNUAL AVERAGE OTHER MOBILE SOURCES (NOT INCLUDING AIRCRAFT, RAIL & SHIP) EMISSIONS IN THE SOUTH COAST AIR BASIN (TONS/DAY)

Year	TOG	VOC	CO	NOx	SOx	TSP	PM_{10}	$PM_{2.5}$
2008	150.97	138.37	904.94	208.24	0.25	15.39	14.90	12.99
2023	108.10	100.46	1,009.67	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*	125.82	117.44	1,185.22	74.75	0.44	15.68	14.11	10.74

* Calculated based on the annualized rate of change observed between 2023 and 2030.

TABLE 3.2-16
FINAL 2007 AQMP FORECAST OF ANNUAL AVERAGE STATIONARY & AREA SOURCE EMISSIONS IN THE SOUTH COAST AIR BASIN (TONS/DAY)

Year	TOG	VOC	CO	NOx	SOx	TSP	PM_{10}	$PM_{2.5}$
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*	544.59	302.87	196.38	77.16	16.95	567.50	294.40	80.43

* Calculated based on the annualized rate of change observed between 2023 and 2030.

Ship emissions are based on separate estimates prepared for ocean-going vessels and harborcraft. ARB updated the marine vessel emissions inventory in 2005 based on 2004 activity data of port of calls by ocean-going vessels. Separate emission estimates were prepared for different modes of operation (i.e., hotelling, maneuvering and transit), engine type (main or auxiliary) and fuel type. Growth rates were extrapolated from changes in 1997-2003 installed power by vessel type and port. The harborcraft inventory was updated in 2004 using vessel population data from the U.S. Coast Guard and the California Department of Fish and Game. CARB adjusted emission factors from the OFFROAD model to account for harborcraft engine cycles. Growth rates are air district specific.

The other mobile source category includes emissions for nine separate sources. In addition to aircraft, rail and ships, the category includes recreational boats, off-road recreational vehicles, off-road farm equipment, farm equipment, fuel storage and handling and truck stops. **Table 3.2-16** provides a summary of the other mobile source category not including aircraft, rail and ship emissions, which are separately presented in **Tables 3.2-13 to 3.2-15**.

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 SCAQMD divides stationary sources into two separate subcategories: point and area. Point sources generally include large emitters with one or more emission sources at a permitted facility with an identified location (e.g., power plants, manufacturing facilities, etc.). [37] Area sources generally include the smaller emission sources that are distributed throughout the region (e.g., home heating, gasoline dispensing, etc.). For 2002, reported data were used for point sources emitting more than 4 tons per year of VOC, NOx, SOx and $PM_{2.5}$ and CO above 100 tons per year. Emissions for a facility were included in the point source category if any of these thresholds were exceeded.

The area source emission estimates were jointly developed by CARB and the SCAQMD for approximately 350 source categories. Special studies were conducted to improve the accuracy

[37] http:/www.aqmd.gov/aqmp/07aqmp/draftfinal/chapter03.pdf.

of several of these categories (e.g., consumer products, architectural coatings, fugitive dust, gasoline dispensing, etc.). In general these studies updated the emission factors to account for the benefits of new rules and base year activity estimates to account for the results of more recent surveys (e.g., sales, product use, etc.)

Industry growth factors for 2002, 2005 and five year increments through 2030 were provided by SCAG. SCAG's demographic forecasts (e.g., housing units, population, etc.) were used as growth surrogates for many of the area source categories. **Table 3.2-16** provides a listing of total stationary and area source annual average emission forecasts for 2008, the base year of the RTP, selected interim years and 2035. Values for 2023 and 2030 are presented as they represent the farthest projection years. Since no forecast for 2035 is currently available, 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 growth and control factors.

Mitigation Measures

Mitigation measures for Impact 3.2-1 would also address this impact.

Significance after Mitigation

After implementation of all feasible mitigation measures the region is anticipated to be able to meet applicable conformity budgets. Thus the impact of consistency with applicable plans would be **less than significant**. Nonetheless, the level of increase in emissions anticipated for the region is considered to be **cumulatively significant** for all pollutants except NOx.

Therefore, construction of the 2008 RTP would have a **significant** and unavoidable impact on regional air quality.

Impact 3.2-5. The 2008 RTP would result in increased trips and VMT as well as increased growth in the region compared to today, resulting in increases in Greenhouse Gas (GHG) emissions.

Greenhouse gas (GHG) emissions associated with the RTP are presented in **Table 3.2-17** for 2020 and 2035. GHG emissions were calculated for construction activity[38], mobile sources[39],

[38] Construction emissions were calculated using ARB's URBEMIS2007 Transportation and Land Use Emission Inventory Model.

[39] Mobile source emissions were calculated using ARB's EMFAC2007 Motor Vehicle Emission Inventory Model and the California Climate Action Registry *General Reporting Protocol* (March 2007).

TABLE 3.2-17
2008 RTP GREENHOUSE GAS EMISSIONS BY COUNTY, 2008, 2020, 2035 [1]

Area and Source	Carbon Equivalent (Million Metric Tonnes per Year) [2]				
	Existing (2008)	Future No Project (2020)	2008 RTP (2020)	Future No Project (2035)	2008 RTP (2035)
Imperial County					
Construction	0.04	0.04	0.04	0.04	0.04
Mobile	1.36	1.90	1.87	2.45	2.37
Electricity	0.59	0.93	1.06	1.17	1.16
Natural Gas	0.37	0.59	0.67	0.74	0.73
Total	2.36	3.46	3.64	4.40	4.30
Los Angeles County					
Construction	0.66	0.65	0.73	0.66	0.73
Mobile	42.28	46.05	45.27	51.19	49.9
Electricity	25.88	27.79	27.94	29.73	30.12
Natural Gas	24.38	26.25	26.39	28.11	28.50
Total	93.2	100.74	100.33	109.69	109.25
Orange County					
Construction	0.10	0.10	0.11	0.10	0.11
Mobile	13.20	14.50	14.30	15.80	15.60
Electricity	7.72	8.50	8.43	8.84	8.90
Natural Gas	8.65	9.55	9.46	9.93	10.00
Total	29.67	32.65	32.3	34.67	34.61
Riverside County					
Construction	0.46	0.46	0.42	0.46	0.43
Mobile	10.49	13.38	13.29	18.10	16.54
Electricity	5.15	7.17	7.14	9.54	9.30
Natural Gas	4.31	6.02	6.00	8.03	7.84
Total	20.41	27.03	26.85	36.13	34.11
San Bernardino County					
Construction	0.33	0.33	0.27	0.33	0.28
Mobile	13.13	16.85	16.42	22.68	20.41
Electricity	5.84	7.40	7.40	9.44	9.08
Natural Gas	4.29	5.44	5.44	6.94	6.67
Total	23.59	30.02	29.53	39.39	36.44
Ventura County					
Construction	0.09	0.09	0.09	0.05	0.06
Mobile	3.37	3.75	3.69	4.26	4.21
Electricity	2.13	2.44	2.42	2.69	2.71
Natural Gas	1.97	2.26	2.25	2.49	2.51
Total	7.56	8.54	8.45	9.49	9.49
Total Emissions	176.79	202.44	201.10	233.77	228.20
2008 RTP Compared to No Project		(1.34)		(5.57)	
2008 RTP Compared to Existing		24.31		51.41	

NOTES:
1. The table does not include all sources of GHG emissions (e.g., industrial processes, agriculture, etc.).
2. Please refer to Appendix B for a complete description of the methodology used to obtain GHG emissions.

natural gas consumption[40], and electricity generation[41]. The 2008 RTP would result in: 201.10 million metric tonnes of CO2e in 2020 and 228.20 million metric tonnes of CO2e in 2035. This

40 Natural gas emissions were calculated based on emission rates obtained from the California Climate Action Registry *General Reporting Protocol* (March 2007).

would be an increase over existing conditions. **Appendix B** contains a list of Greenhouse Gas mitigation measures recommended by the Attorney General and how they are addressed by the RTP and this PEIR. Appendix B also contains a more detailed description of the methodology used to calculate greenhouse gas emissions. The detailed calculations (over 700 pages) are on file and available for review at SCAG offices.

As previously discussed, the purpose of AB 32 is to reduce statewide GHG emissions to 1990 levels by 2020. Since the SCAG region contributes at least 39 percent of existing GHG emissions in the State, it is vital that SCAG regional GHG emissions be reduced in order for the State to meet this goal. Therefore, for purposes of this analysis, any increase in GHG emissions from existing conditions to RTP conditions would result in a significant impact. GHG emissions in 2020 and 2035 with the 2008 RTP would be substantially greater than existing GHG emissions for the SCAG region. Therefore, unmitigated SCAG GHG emissions would not be consistent with AB 32, and the RTP could result in a significant global warming impact without incorporation of mitigation measures.

Comparison to the No Project

As shown in **Table 3.2-17**, Future (2020) No Project conditions would result in 202.44 million metric tonnes of CO2e and Future (2035) No Project conditions would result in 233.77 million metric tonnes of CO2e. The 2008 RTP would result in slightly fewer emissions than under the No Project condition: 201.10 million metric tonnes of CO2e in 2020 and 228.20 million metric tonnes of CO2e in 2035. RTP GHG emissions would be less than Future No Project emissions in both 2020 and 2035. This is due to decreased regional vehicle miles traveled associated with the RTP when compared to No Project conditions.

Mitigation Measures

GHG emissions are generally associated with the combustion of fossil fuel to power motor vehicles and provide energy. As such, the most effective way to reduce GHG emissions is to reduce energy use and associated fossil fuel combustion. Section 3.5 Energy provides a comprehensive list of mitigation measures that would reduce fossil fuel combustion in the SCAG region. Additional measures are as follows:

MM-AQ.15: Project sponsors should, where feasible, implement policies for sustainable airport development, management and airfield design to reduce air pollution and GHG emissions from operations, including cargo operations, ground support and access to and from airports (see Los Angeles World Airports Sustainability Vision and Principles and the Green LA Action Plan, hereby incorporated by reference).

MM.AQ-16: Project sponsors should, where feasible, implement a green construction policy that could include:

[41] Electricity generation emissions were calculated indirectly as a function of regional electricity use. Emission rates obtained from the California Climate Action Registry *General Reporting Protocol* (March 2007).

- Ensuring that all off-road construction vehicles should be alternative fuel vehicles, or diesel powered vehicles with Tier 3 or better engines or retrofitted/repowered -to meet equivalent emissions standards as Tier 3 engines;
- Using the minimum feasible amount of GHG emitting construction materials;
- Using cement blended with the maximum feasible amount of flyash or other materials that reduce GHG emissions
- Using asphalt with light colored additives and chemical additives that increase reflectivity and therefore reduce contribution to the heat island effect
- Requiring recycling of construction debris to maximum extent feasible
- Incorporating planting of shade trees into construction projects where feasible

MM.AQ-17: Local governments should set specific limits on idling time for commercial vehicles, including delivery and construction vehicles.

Significance after Mitigation

The degree to which the proposed energy mitigation measures will be implemented is difficult to estimate. Improvements in air pollutant emission standards and increased use of alternative fuels would reduce GHG emissions. However, it is unlikely that mitigation measures would reduce GHG emissions below existing (let alone to 1990 levels as required by AB 32) due to anticipated population growth. As such, the 2008 RTP would result in a **significant** and unavoidable global warming impact.

References – Air Quality

Imperial County Air Pollution Control District. April 1992. 1991 Air Quality Attainment Plan.

Mojave Desert Air Quality Management District. January 1996. *Triennial Revision to the 1991 Air Quality Attainment Plan*.

South Coast Air Quality Management District. April 1993. *1993 CEQA Air Quality Handbook*

South Coast Air Quality Management District. June 2007. *Final 2007 Air Quality Management Plan.*

U.S. Environmental Protection Agency, Office of Compliance, Office of Enforcement and Compliance Assurance. October 1998. *EPA Office of Compliance Sector Notebook Project: Air Transportation Industry*.

Ventura County Air Pollution Control District. November 1996. *1994 Air Quality Management Plan*.

3.3 Biological Resources

This section describes the existing ecosystems, sensitive species and communities that inhabit the SCAG region and discusses current threats and protection efforts for these biological resources. Furthermore, this section identifies expected impacts of implementation of the RTP on these resources, includes 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.[1]

Environmental 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 California Department of Fish and Game (CDFG), 2007. Typical natural communities and series will be described for each ecosystem type, as well as representative and special status species. **Map 3.3-1**, included in the Map Chapter at the end of this document, shows the general location of natural vegetation types that represent the variety of ecosystems within the SCAG region. **Map 3.3-2,** included in the Map Chapter at the end of this document, 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 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

[1] Munz, P.A. (1974). *A flora of southern California* (pp. 1086). Berkeley, CA: University of California Press.

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, 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 (see appendix) 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).

Dunes

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.[2] 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.

[2] Barbour, M. G. & Johnson, A.. Beach and dune. In Barbour, M. G. & Major, J. (Eds.). *Terrestrial vegetation of California*. City: John Wiley and Sons.

Dune environments 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.

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 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, California ground squirrels *(Spermophilus beechyi*), and black-tailed deer) 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 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 fallax*), and California gnatcatcher (*Polioptila californica 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 (EPA, 2006). Wetlands include riparian areas, inland waters, and marine and estuarine environments. Each supports a diverse array of biological communities, described below. **Map 3.3-2** included in the Map Chapter at the end of this document, 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. The Water Resources chapter discusses the characteristics of these surface waters.

TABLE 3.3-1
NATURAL WETLANDS

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, RIV, SBD		unknown
Bolsa Chica Wetlands	LA	880 acres protected	12
Ballona Lagoon	LA	16.3 acres enhanced	4
Ballona Creek Wetlands	LA	86 acres protected	10
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	ORA	3.4 acres protected	10
Henrietta Marsh	LA	5 acres enhanced	unknown
Hidden Valley Wildlife Area	RIV	70 acres enhanced	unknown
Huntington Beach Wetlands	OR		9
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		3
Los Cerritos Wetlands	LA	16 acres protected	6
Malibu Lagoon	LA	33 acres protected	8
McGrath Lake	VEN		3
Mugu Lagoon	VEN	2,000 acres protected	33
Mystic Lake	RIV	175 acres protected	unknown
Ormond Beach Wetlands	VEN		12
Picacho State Rec Area	IMP	20 acres enhanced	unknown
San Joaquin Marsh	OR		14
San Juan Creek	OR		1
Santa Ana River Mouth	OR		17
San Jacinto Wildlife Area	RIV	360 acres enhanced	unknown
Santa Clara River Estuary	VEN		8
Santa Margarita River/Lagoon	RIV, SDG	250 acres protected; 600 acres restored	20
Topanga Lagoon	LA		0
Trancas Lagoon	LA		0
Upper Newport Bay	OR	757 acres protected	6
Ventura River Estuary	VEN	110 acres enhanced	10

SOURCE: California Resources Agency. (1998). Southern California Wetlands Inventory. http://ceres.ca.gov/wetlands/geo_info/so_cal.html. Accessed November 2007.
California Coastal Conservancy. (2003). Southern California Wetlands Recovery Project. http://www.scwrp.org/work_plan.htm. Accessed November 2007.

Interior Wetlands

Interior wetlands include lakes, wet meadows, freshwater and alkali marshes, alkali meadows, freshwater and alkali seeps, vernal pools, and alkali playas. By their nature, these habitats are uncommon in the arid, summer-dry SCAG region, and most are considered special status by CNDDB. The larger and fresher the water feature, the more development pressure it has likely experienced.

Wet meadows occur on permanently moist soil and are dominated by perennial grasses, sedges (*Carex* spp.), and rushes (*Juncus* spp.). In the SCAG region, they are most common at higher elevations. Alkali marshes, meadows, and seeps are characterized by plant species adapted to relatively high concentrations of salts. They typically occur in poorly drained areas with relatively high evaporation. Alkali meadows occur on moist soil affected by salts and are dominated by perennial grasses and sedges. Alkali marshes occasionally occur along the Colorado River in eastern Riverside and Imperial Counties. Alkali seeps are scattered throughout desert regions. Alkali playas occur in the desert areas on poorly drained soils with high salinity or alkalinity, often with a high water table and salt crusts on the surface. Some of the common vegetation series represented in these habitats are saltgrass series, sedge series, bulrush (*Scirpus* spp.), cattail (*Typha* spp.), and spikerush (*Eleocharis* spp.) series. Alkali seeps, southern coastal salt marshes, cismontane alkali marshes, and transmontane alkali marshes are recognized as special status communities by CDFG.

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 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 plants species occur in southern coastal salt marsh, 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 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.**

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).

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: California Resources Agency and Information Center for the Environment. (1997). California Rivers Assessment (CARA) - ICE. http://endeavor.des.ucdavis.edu/newcara/. Accessed November 2007.

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 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 fishes, and many native fishes found in the SCAG region are currently of endangered or threatened status because of habitat losses and water quality degradation. Native fishes 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 fishes 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 fishes reported, but it is also very productive. Fish families prominent in the SCAG coastal waters include 23 species of viviparous perches (Embiotocidae), more than 60 species of sea basses (Sebastes), about 60 species of sculpin (Cottidae), over 20 species of flounder (Pleuronectidae), five species of salmon (Salmonidae), and various rockfishes (Scorpaenidae) and other small bottom fishes (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*) which 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*).

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 BIO-1, in the technical appendices, lists by county, the scientific and common name and protection status for special status species found within the SCAG area. The lists contain 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.

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, the areas have been established as protected reserves.

The CNDDB reports forty-five special status natural communities in the six-county SCAG region. Table BIO-2, in the technical appendices, presents these communities, and the counties in which they have been reported. These locations are shown on **Map 3.3-3,** included in the Map Chapter at the end of this document.

Threats to Biological Resources in the SCAG Region

Major threats to biological resources in the SCAG region (described below) 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.[3]

Within California some 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.[4] 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.

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3 de Maynadier, P. G. & Hunter Jr, M. Road effects on amphibian movements in a forested landscape. *Natural Areas Journal, 20(1)*, 56-65.

4 Dahl, T.E. (1990). *Wetlands losses in the United States1790's to 1980's*. Washington, DC: United States Department of the Interior, Fish and Wildlife Service. Retrieved, August 28, 2003, from Northern Prairie Wildlife Research Center Web site: http://www.npwrc.usgs.gov/resource/othrdata/wetloss/wetloss.htm.

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.[5]

Protection of Biological Resources in the SCAG Region

Table BIO-3, 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.[6] 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 3.3-3** provides the status of NCCP programs in the SCAG region.

Regulatory Setting

The following federal and state regulations affect biological resources. The regulations are organized by the agency that implements them.

5 California Department of Fish and Game. (2007). *California Wildlife: Conservation Challenges*. http://www.dfg.ca.gov/habitats/WDP/report.htm Accessed May 2007

6 California Department of Fish and Game. (2007). *Natural Community Conservation Planning - Southern California coastal sage scrub NCCP region*. http://www.dfg.ca.gov/habcon/nccp/index.html Accessed November 2007.

TABLE 3.3-3
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 Feb 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	209,000	37,380	Plan approved July 1996. Plan is being implemented.
Orange	Orange County Southern Subregion HCP[a]	Orange County	91,000	11,950	Final Plan approved by Board of Supervisors in November 2006. Permits issued January 2007.
Riverside	Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP)	Coachella Valley Association of Governments	1,136,261	747,600	Final Plan Development – released for comment May 2007.
Riverside	Western Riverside County Multiple Species Habitat Conservation Plan	Riverside County	1.2 million	500,000	Final Plan approved by County in July, 2003. FWS and DFG approved in June 2004. Permits issued June 2004.

SOURCE: California Department of Fish and Game. (2007). *Status of NCCP Planning Efforts*. www.dfg.ca.gov/habcon/nccp/status.htm. Accessed November 2007.
Daniel. (2001). *The Future of Habitat Conservation? The NCCP Experience in Southern California.* Prepared at the request of Senator Byron D. Sher.
[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.

Federal Agencies and Regulations

Council on Environmental Quality (CEQ) and U.S. Environmental Protection Agency (US EPA)

NEPA mandates that the federal government shall give appropriate consideration to potential adverse environmental impacts of their major actions, including impacts to biological resources. The Council on Environmental Quality oversees NEPA, and the EPA carries out administrative aspects of the NEPA process.

United States Fish and Wildlife Service (USFWS)

USFWS is the implementing agency for the Federal Endangered Species Act (FESA). The FESA provides protection for animal and plant species that are currently in danger of extinction

(endangered) and species that may become so in the foreseeable future (threatened), and it provides a means to conserve the ecosystems of these species.[7]

"Candidate" species are taxa that USFWS is considering for listing as endangered and threatened, but which have yet to be the subject of a proposed rule, and they are afforded no protection under the FESA. However most federal agencies with resource management responsibilities (United States Forest Service, United States Bureau of Land Management, USFWS) accord some level of protection or management consideration to candidates, and when long-term planning efforts, such as Habitat Conservation Plans, are established, candidate species are often included because they could become listed during the lifetime of the plan. Such policies are not mandatory under the FESA.

Section 7 of this Act requires federal departments and agencies to consult with the USFWS to ensure that actions they authorize, fund, or carry out will not jeopardize species listed under FESA. Section 9 of FESA prohibits the "taking"[8] of listed species, including inadvertent harm, harassment, collection, or significant habitat modification, except by authorized permit. USFWS implements a number of other regulatory acts that affect biological resources. These include: The Migratory Bird Treaty Act, an international treaty for the conservation and management of bird species which may migrate through more than one country; the Federal Bald Eagle Protection Act of 1940, intended to protect individual bald eagles and their nests and eggs from willful damage or injury.

United States Army Corps of Engineers (USACE)

The USACE regulates activities in navigable waterways, wetlands and the ocean through various regulations. USACE have regulatory authority over the dumping of trash and sewage and are responsible for permitting dredge and fill in wetlands. A major aspect of the regulatory program is determining which areas qualify for protection as wetlands.[9] Wetlands are defined as those areas that are inundated or saturated by surface or ground water frequently enough to support vegetation typically adapted for life in saturated soil conditions.

The USACE is also responsible for granting permits to implement the Marine Protection, Research and Sanctuaries Act of 1972. This Act regulates the transportation of dredged materials into ocean waters, and it allowed for establishment of Marine Sanctuaries, such as the Channel Islands National Marine Sanctuary.

7 U.S. Fish and Wildlife Services Fact Sheet. (2002). "*ESA basics*." Washington, D.C.

8 "Take" is defined by Federal Regulation Code 17.3 (1975) as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. The term "harm" is defined as an act or omission which actually injures or kills wildlife, including acts which annoy it to such an extent as to significantly disrupt essential behavioral patterns, which include, but are not limited to, breeding, feeding, sheltering, or significant environmental modification or degradation of critical habitat that results in these effects."

9 United States Army Corps of Engineers. (2002, September 24). *Wetlands and waterways regulation and permitting*. http://www.usace.army.mil/public.html#Regulatory Accessed August 2003.

State Agencies and Regulations

California Department of Fish and Game (CDFG)

CDFG is required under the California Endangered Species Act (CESA), California Native Plant Protection Act (NPPA), CEQA, and Natural Community Conservation Planning Act (NCPPA) to conserve species through listing, habitat acquisition and protection. The CDFG is also responsible for review of local land use planning, multi-species conservation planning, stewardship, recovery, research, and education.

CEQA includes the policy of the state to "prevent the elimination of fish or wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities." CEQA directs agencies to consult with the CDFG on any project the agency initiates that is not statutorily or categorically exempt from CEQA. CEQA Guidelines(Section 15065(a)) declare that impacts to rare, threatened or endangered plants or animals are significant, and impacts to other species may be considered significant by the lead agency, depending on the applicability of other laws (e.g., Migratory Bird Treaty Act) and the discretion of the agency.

CDFG is authorized to enter into Streambed Alteration Agreements with applicants that propose a project that would obstruct the flow or alter the bed, channel, or bank of a river or stream, including intermittent and ephemeral streams, where there is a fish or wildlife resource. Streambed Alteration Agreements usually include measures designed to protect biological resources.

California Coastal Commission (CCC)

The CCC manages protection of biological resources through a permitting process for all projects in the coastal zone. 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 5 miles inland from mean high tide line. In developed urban areas, the coastal zone extends substantially less than 1,000 yards inland. In order to carry out the policies of the Coastal Act, a city and county in the coastal zone is required to prepare and submit a Land Conservation Plan for the portion of its jurisdiction within the coastal zone to the CCC for certification.

Through the Coastal Act, the CCC has unusually broad authority to regulate development in the Coastal Zone. A permit is required for any projects 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 CCC considers net effects on rare and endangered species, and whether the project would substantially change any of the existing biological resources, including biodiversity.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the proposed Plan on biological resources.

Comparison with the No Project

The analysis of biological resources 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 to existing conditions); however, it provides a meaningful perspective on the effects of the 2008 RTP.

Determination of Significance

The impact assessment for biological resources focuses on significant effects the proposed Plan and associated growth would likely have on biological 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 the existing biological resources, as required under the CEQA Guidelines.

SCAG's Geographic Information System (GIS) was used to identify projects and associated growth that may cause a significant effect on biological resources. Specifically, using GIS spatial data, potential regional-level adverse effects were identified by overlaying 2008 RTP projects upon the distribution and locations of known biological resources, including natural vegetation, wetlands and water resources, and special status species and communities. GIS analysis calculated the acreage or extent of biological resources occurring within 150 feet and 0.25 miles of either side of freeway, transit and freight rail projects included in the 2008 RTP. The 150 foot zone was used for more precise impacts, such as the conversion of vegetation types. The 0.25 mile zone on either side of the transportation projects was used to capture the effects that extend beyond the road itself, including changes in light, temperature, noise, fire regime, risk of predation and spread of invasive species.

The impacts-analysis identifies direct intersection between proposed Plan projects and existing biological 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.

Significance Criteria

A significant impact is defined as "a substantial or potentially substantial, adverse change in the environment" (CEQA § 21068). The proposed Plan would have a significant impact on biological resources if implementation were to:

- Substantially reduce the habitat of a fish or wildlife species;

- Cause a fish or wildlife population to drop below self-sustaining levels;
- Threaten to eliminate a plant or animal community;
- Restrict the range of a rare or endangered plant or animal;
- Substantially and adversely affect, either directly or through habitat modification, any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFG or USFWS;
- Substantially and adversely affect any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or USFWS;
- Substantially and adversely affect federally protected wetlands as defined by Section 404 of the Clean Water Act (CWA), including, but not limited to, marsh and vernal pool, through direct removal, filling, hydrologic interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with provisions of an adopted HCP, Natural Community Conservation Plan; or
- Cause a cumulatively considerable adverse effect on regional biological resources.

Impacts and Mitigation Measures

Implementation of the 2008 RTP would adversely affect biological resources. 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, and siltation of streams and other water bodies during construction. Cumulatively, 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 2008 RTP. These include short-term construction related impacts, and long-term or permanent displacement or offsite impacts from new facilities.

Whenever a project is located near project-specific biological resources of concern or within habitats capable of supporting such resources (see Table 3.3-4), a biological resources evaluation would need to be conducted and project-specific impacts with appropriate feasible mitigation measures identified.

Below are descriptions of the types of direct impacts foreseeable from new transportation projects proposed in the 2008 RTP. Indirect, cumulative impacts due to the changes in population distribution expected to occur due to the 2008 RTP's transportation investments, and transportation and land use policies are also discussed.

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.

Impact 3.3-1: Transportation projects included in the 2008 RTP on previously undisturbed land could displace natural vegetation, and thus habitat, some of which is utilized by sensitive species in the SCAG region.

The significance of this impact would relate to the extent, and type of natural vegetation displaced. It is assumed that any 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 3.3-3 in the Map Chapter at the end of this document). The CNDDB system relies on reported sightings of sensitive species, and it is not a complete inventory of sensitive species habitat. The intersection of 2008 RTP projects with these known habitat occurrences is provided as additional information. Intersections with point data that are included in CNDDB and that are based on individual species sightings are not included in **Table 3.3-4**. These point data are of varying reliability. Impacts associated with the intersection of 2008 RTP transportation projects and habitat (shown in **Map 3.3-1**) are more conservative and lend a fuller picture of the potential impacts of the 2008 RTP projects. This analysis of transportation project intersection with natural vegetation and habitat is used to determine significance.

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 transportation project would affect the size of the disruption. The addition of a lane would be expected to cause less disruption than an entirely new road, for example. Transportation projects in the 2008 RTP that would intersect with special status species habitat known and reported by the CNDDB are shown in **Map 3.3-3** in the Map Chapter at the end of this document, and potential effects are summarized in **Table 3.3-5**. There are approximately 47,500 acres of special status plant habitat, animal habitat, and special status aquatic and terrestrial communities that occur within 150 feet of the 2008 RTP freeway, transit, and freight rail projects, and about 32,200 acres within 150 feet of projects within the No Project Alternative. If no additional projects were built no special status plant and animal habitat would be impacted.

TABLE 3.3-4
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	Individual Listed And Special-Status Plant Species	Coastal Marine Resources	Conifer Forests And Woodlands	Desert Shrub And Woodland	Dunes (Beach And Dune-Coastal And Interior)	Grasslands	Hardwood Forests And Woodlands	Riparian	Scrub (Chaparral And Coastal Scrub)	Wetlands And Streams Or Rivers	IMPERIAL	LOS ANGELES	ORANGE	RIVERSIDE	SAN BERNARDINO	VENTURA
	Munz's onion *Allium munzii*		X			X	X		X					X		X
	San Diego ambrosia *Ambrosia pumila*					X			X					X		
	Hoffman's rock cress *Arabis hoffmannii*								X							X
	Marsh sandwort *Arenaria paludicola*									X		X		X	X	
	Big Bear valley sandwort *Arenaria ursina*		X							X					X	
	Cushenbury milk-vetch *Astragalus albens*		X	X			X								X	
	Braunton's milk-vetch *Astragalus brauntonii*		X			X			X						X	
	Lane mountain milk-vetch *Astragalus jaegerianus*			X											X	
	Coachella Valley milk-vetch *Astragalus lentiginosus* var. *coachellae*			X										X		
	Peirson's milk-vetch *Astragalus magdalenae* var. *personii*				X						X					

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	Individual Listed And Special-Status Plant Species	Coastal Marine Resources	Conifer Forests And Woodlands	Desert Shrub And Woodland	Dunes (Beach And Dune-Coastal And Interior)	Grasslands	Hardwood Forests And Woodlands	Riparian	Scrub (Chaparral And Coastal Scrub)	Wetlands And Streams Or Rivers	IMPERIAL	LOS ANGELES	ORANGE	RIVERSIDE	SAN BERNARDINO	VENTURA
	Ventura marsh milk-vetch *Astragalus pyncnostachyus var.lanosissimus*				X					X		X	X			X
	Coastal Dunes milk-vetch *Astragalus tener* var. *titi*				X					X		X				
	Trask's milk-vetch *Astragalus traskiae*				X				X							X
	Triple-ribbed milk-vetch *Astragalus tricarinatus*			X				X						X	X	
	San Jacinto Valley crownscale *Atriplex coronata* var. *notatior*					X			X	X				X		
	Nevin's barberry *Berberis nevinii*						X	X	X			X		X	X	
	Island barberry *Berberis pinnata* ssp. *insularis*		X				X		X							X
	Thread-leaved brodiaea *Brodiaea flifolia*					X	X		X	X		X	X	X	X	
	Ash-gray Indian paintbrush *Castilleja cinerea*		X	X											X	

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	**Individual Listed And Special-Status Plant Species**	**Coastal Marine Resources**	**Conifer Forests And Woodlands**	**Desert Shrub And Woodland**	**Dunes (Beach And Dune-Coastal And Interior)**	**Grasslands**	**Hardwood Forests And Woodlands**	**Riparian**	**Scrub (Chaparral And Coastal Scrub)**	**Wetlands And Streams Or Rivers**	**IMPERIAL**	**LOS ANGELES**	**ORANGE**	**RIVERSIDE**	**SAN BERNARDINO**	**VENTURA**
	Mt. Gleason Indian paintbrush *Castilleja gleasonii*		X									X				
	San Clemente Island Indian paintbrush *Castilleja grisea*				X				X			X				
	Vail lake ceanothus *Ceanothus ophiochilus*								X					X		
	Catalina Island mountain-mahogany *Cercocarpus traskiae*								X			X				
	San Fernando Valley spineflower *Chorizanthe parryi* var. *fernandina*								X			X	X			X
	Salt marsh bird's-beak *Cordylanthus maritimus* ssp *maritimus*								X	X		X	X	X	X	X
	Wiggin's croton *Croton wigginsii*			X	X						X					
	Santa Susana tarplant *Deinandta minthornii*								X			X			X	
	Mojave tarplant *Deinandra mohavensis*							X	X					X	X	
	Cuyamaca larkspur *Delphinium hesperium* ssp. *cuyamacae*		X											X		
	San Clemente Island larkspur *Delphinium variegatum* ssp. *kinkiense*					X						X				

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	**Individual Listed And Special-Status Plant Species**	**Coastal Marine Resources**	**Conifer Forests And Woodlands**	**Desert Shrub And Woodland**	**Dunes (Beach And Dune-Coastal And Interior)**	**Grasslands**	**Hardwood Forests And Woodlands**	**Riparian**	**Scrub (Chaparral And Coastal Scrub)**	**Wetlands And Streams Or Rivers**	**IMPERIAL**	**LOS ANGELES**	**ORANGE**	**RIVERSIDE**	**SAN BERNARDINO**	**VENTURA**
	Beach spectaclepod *Dithyrea maritima*				X				X			X				X
	Slender-horned spineflower *Dodecahema leptoceras*								X			X	X	X	X	
	Agoura hills dudleya *Dudleya cymosa* ssp. *agourensis*						X		X			X				X
	Marcescent dudleya *Dudleya cymosa* ssp. *marcescens*								X			X				X
	Santa Monica Mountains dudleya *Dudleya cymosa* ssp. *ovatifolia*								X			X	X			
	Conejo dudleya *Dudleya parva*					X			X							X
	Laguna Beach dudleya *Dudleya stolonifera*					X	X		X				X			
	Verity's dudleya *Dudleya verityi*						X		X							X
	Santa Ana River woollystar *Eriastrum densifolium* ssp. *sanctorum*								X				X	X	X	
	Parish's daisy *Erigeron parishii*		X	X										X	X	
	Conejo buckwheat *Eriogonum crocatum*					X			X							X

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	Individual Listed And Special-Status Plant Species	Coastal Marine Resources	Conifer Forests And Woodlands	Desert Shrub And Woodland	Dunes (Beach And Dune-Coastal And Interior)	Grasslands	Hardwood Forests And Woodlands	Riparian	Scrub (Chaparral And Coastal Scrub)	Wetlands And Streams Or Rivers	IMPERIAL	LOS ANGELES	ORANGE	RIVERSIDE	SAN BERNARDINO	VENTURA
	San Nicolas Island buckwheat *Eriogonum grande* var. *timorum*				X				X							X
	Southern mountain buckwheat *Eriogonum kennedyi* var.*austromontanum*		X												X	
	Cushenbury buckwheat *Eriogonum ovalifolium* var. *vineum*		X	X											X	
	Thorne's buckwheat *Eriogonum thornei*		X												X	
	San Diego button celery *Eryngium aristulatum* var. *parishii*					X			X	X	X			X		
	San Clemente Island bedstraw *Galium catalinense* ssp. *acrispum*					X						X				
	Island rush-rose *Helianthemum greenei*		X						X			X				
	Algodones Dune's sunflower *Helianthus niveus* ssp. *tephrodes*			X							X					
	Tahquitz ivesia *Ivesia callida*		X											X		
	San Bernardino Mountains bladderpod *Lesquerella kingii* ssp. *bernardina*		X												X	
	Parish's meadowfoam *Limnanthes gracilis* ssp. *parishii*									X				X		

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	Individual Listed And Special-Status Plant Species	Coastal Marine Resources	Conifer Forests And Woodlands	Desert Shrub And Woodland	Dunes (Beach And Dune-Coastal And Interior)	Grasslands	Hardwood Forests And Woodlands	Riparian	Scrub (Chaparral And Coastal Scrub)	Wetlands And Streams Or Rivers	IMPERIAL	LOS ANGELES	ORANGE	RIVERSIDE	SAN BERNARDINO	VENTURA
	San Clemente Island woodland star *Lithophragma maximum*				X				X			X				
	San Clemente Island bird's-foot trefoil *Lotus argophyllus* var. *adsurgens*				X				X			X				
	San Clemente Island lotus *Lotus dendroideus* var. *traskiae*				X	X			X			X				
	San Clemente Island bush mallow *Malacothamnus clementinus*					X		X				X				
	Island malacothrix *Malacothrix squalida*				X		X		X							X
	Gambel's water cress *Nasturtium gambelii*									X						X
	Spreading navarretia *Navarretia fossalis*								X	X		X		X		
	California orcutt grass *Orcuttia californica*									X		X		X		X
	Cushenbury Oxytheca *Oxytheca parishii* var. *goodmaniana*		X												X	
	Lyon's pentachaeta *Pentachaeta lyonii*					X			X			X				X
	San Bernardino blue grass *Poa atropurpurea*					X				X					X	

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	Individual Listed And Special-Status Plant Species	Coastal Marine Resources	Conifer Forests And Woodlands	Desert Shrub And Woodland	Dunes (Beach And Dune-Coastal And Interior)	Grasslands	Hardwood Forests And Woodlands	Riparian	Scrub (Chaparral And Coastal Scrub)	Wetlands And Streams Or Rivers	IMPERIAL	LOS ANGELES	ORANGE	RIVERSIDE	SAN BERNARDINO	VENTURA
	Santa Cruz island rock cress *Sibara fillifolia*								X			X				
	Bird-foot checkerbloom *Sidalcea pedata*					X				X					X	
	California dandelion *Taraxacum californicum*					X									X	
	Slender-petaled thelypodium *Thelypodium stenopetalum*									X					X	
	Hidden lake bluecurls *Trichostema austromontanum* ssp. *compactum*		X											X		
	Crownbeard *Verbesina dissita*								X				X			
	Southwestern pond turtle *Actinemys marmorata pallida*							X		X		X	X	X	X	X
	Cooper's hawk *Accipiter cooperii*						X	X			X	X	X	X	X	X
	Tricolored blackbird *Agelaius tricolor*							X		X		X	X	X	X	X
	Southern California rufous crowned sparrow *Aimophila ruficeps canescens*								X			X	X	X	X	X
	California tiger salamander *Ambystoma californiense*					X	X	X		X				X		

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	**Individual Listed And Special-Status Plant Species**	**Coastal Marine Resources**	**Conifer Forests And Woodlands**	**Desert Shrub And Woodland**	**Dunes (Beach And Dune-Coastal And Interior)**	**Grasslands**	**Hardwood Forests And Woodlands**	**Riparian**	**Scrub (Chaparral And Coastal Scrub)**	**Wetlands And Streams Or Rivers**	**IMPERIAL**	**LOS ANGELES**	**ORANGE**	**RIVERSIDE**	**SAN BERNARDINO**	**VENTURA**
	Nelson's antelope squirrel *Ammospermophilus nelsoni*			X				X	X	X		X				
	San Clemente sage sparrow *Amphispiza belli clementeae*			X					X			X				
	Golden Eagle *Aquila chrysaetos*		X	X		X	X		X			X	X	X	X	X
	Burrowing owl *Athene cunicularia*			X		X	X		X		X	X	X	X	X	X
	Desert slender salamander *Batrachoseps major aridus*		X	X			X							X		
	Vernal pool fairy shrimp *Branchinecta lynchi*							X		X				X		X
	San Diego fairy shrimp *Branchinecta sandiegonensis*					X				X			X			
	Ferriginous hawk *Buteo regalis*		X	X		X			X			X	X	X	X	X
	Swainson's hawk *Buteo swainsoni*					X		X				X			X	
	Arroyo Toad *Bufo californicus*			X				X	X	X		X	X	X	X	X
	Santa Ana sucker *Catostomus santaanae*									X		X	X	X	X	X

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	**Individual Listed And Special-Status Plant Species**	**Coastal Marine Resources**	**Conifer Forests And Woodlands**	**Desert Shrub And Woodland**	**Dunes (Beach And Dune-Coastal And Interior)**	**Grasslands**	**Hardwood Forests And Woodlands**	**Riparian**	**Scrub (Chaparral And Coastal Scrub)**	**Wetlands And Streams Or Rivers**	**IMPERIAL**	**LOS ANGELES**	**ORANGE**	**RIVERSIDE**	**SAN BERNARDINO**	**VENTURA**
	Western snowy plover *Charadrius alexandrinus rivosus*	X			X			X				X	X	X	X	X
	Southern rubber boa *Charina (bottai) umbratica*		X					X		X				X	X	
	Western yellow-billed cuckoo *Coccyzus americanus occidentalis*		X					X		X	X	X		X	X	X
	Gilded flicker *Colaptes chrysoides*			X				X			X			X		
	Barefoot banded gecko *Coleonyx switaki*			X							X					
	Desert pupfish *Cyprinodon macularius*							X		X		X	X	X	X	X
	Amargosa pupfish *Cyprinodon nevadensis amargosae*									X		X	X	X	X	X
	Saratoga springs pupfish *Cyprinodon nevadensis nevadensis*									X		X	X	X	X	X
	San Bernardino Merriamus kangaroo rat *Dipodomys merriami parvus*		X	X					X					X	X	
	Stephen's kangaroo rat *Dipodomys stephensi*					X			X					X	X	
	Southwestern willow flycatcher *Empidonax traillii extimus*					X		X			X	X	X	X	X	

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	Individual Listed And Special-Status Plant Species	Coastal Marine Resources	Conifer Forests And Woodlands	Desert Shrub And Woodland	Dunes (Beach And Dune-Coastal And Interior)	Grasslands	Hardwood Forests And Woodlands	Riparian	Scrub (Chaparral And Coastal Scrub)	Wetlands And Streams Or Rivers	IMPERIAL	LOS ANGELES	ORANGE	RIVERSIDE	SAN BERNARDINO	VENTURA
	Tidewater goby *Eucyclogobius newberryi*							X				X	X	X	X	X
	California mastiff bat *Eumops perotis californicus*		X	X		X			X		X	X	X	X	X	X
	El Segundo blue butterfly *Euphilotes battoides allyni*				X							X				
	Quino checkerspot butterfly *Euphydryas editha quino*				X				X					X		
	Prairie falcon *Falco mexicanus*			X		X			X		X	X		X	X	X
	American peregrine falcon *Falco peregrinus anatum*			X						X		X				
	Blunt-nosed leopard lizard *Gambelia sila*			X		X			X							X
	Unarmored threespine stickleback *Gasterosteus aculeatus williamsoni*							X		X		X	X	X	X	X
	Mohave tui chub *Gila bicolor mohavensis*			X				X		X		X	X	X	X	X
	Bonytail Gila elegans							X		X		X	X	X	X	X
	Arroyo chub *Gila orcutti*									X		X	X	X	X	X

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	Individual Listed And Special-Status Plant Species	Coastal Marine Resources	Conifer Forests And Woodlands	Desert Shrub And Woodland	Dunes (Beach And Dune-Coastal And Interior)	Grasslands	Hardwood Forests And Woodlands	Riparian	Scrub (Chaparral And Coastal Scrub)	Wetlands And Streams Or Rivers	IMPERIAL	LOS ANGELES	ORANGE	RIVERSIDE	SAN BERNARDINO	VENTURA
	Palos Verdes blue butterfly *Glaucopsyche lygdamus palosverdesensis*				X	X			X			X				
	Desert tortoise *Gopherus agassizii*			X							X	X		X	X	
	California condor *Gymnogyps californianus*		X			X	X		X			X				X
	Bald Eagle *Haliaeetus leucocephalus*	X	X				X			X		X		X	X	
	Yellow-breasted chat *Icteria virens*							X	X		X	X	X	X	X	X
	San Clemente loggerhead shrike *Lanius ludovicianus mearnsi*		X	X			X	X				X				
	Hoary bat *Lasiurus cinereus*		X	X			X				X	X	X	X	X	X
	California black rail *Laterallus jamaicensis coturniculus*									X	X	X	X			
	California leaf-nosed bat *Macrotus californicus*			X				X			X	X		X	X	X
	Gila woodpecker *Melanerpes uropygialis*			X				X			X			X	X	
	Elf Owl *Micrathene whitneyi*			X		X		X			X			X	X	

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	Individual Listed And Special-Status Plant Species	Coastal Marine Resources	Conifer Forests And Woodlands	Desert Shrub And Woodland	Dunes (Beach And Dune-Coastal And Interior)	Grasslands	Hardwood Forests And Woodlands	Riparian	Scrub (Chaparral And Coastal Scrub)	Wetlands And Streams Or Rivers	IMPERIAL	LOS ANGELES	ORANGE	RIVERSIDE	SAN BERNARDINO	VENTURA
	Yuma myotis *Myotis yumanensis*										X	X	X	X	X	
	San Diego desert woodrat *Neotoma lepida intermedia*		X				X					X	X	X	X	X
	Pocketed free-tailed bat *Nyctinomops femorasaccus*			X			X	X			X	X	X	X	X	
	Southern steelhead *Oncorhynchus mykiss irideus*	X						X		X		X	X	X	X	X
	Peninsular bighorn sheep *Ovis Canadensis nelsoni*			X				X	X		X			X		
	Belding's savannah sparrow *Passerculus sandwichensis beldingi*			X		X		X		X		X	X			X
	California brown pelican *Pelecanus occidentalis californicus*	X														X
	Pacific pocket mouse *Perognathus longimembrus pacificus*		X	X		X			X			X	X			
	Coast (San Diego) horned lizard *Phrynosoma coronatum blainvillii*			X		X			X			X	X	X	X	X
	Coastal California gnatcatcher *Polioptila californica californica*								X			X	X	X	X	X
	Colorado squawfish *Ptychocheilus lucius*							X		X		X	X	X	X	X

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	Individual Listed And Special-Status Plant Species	Coastal Marine Resources	Conifer Forests And Woodlands	Desert Shrub And Woodland	Dunes (Beach And Dune-Coastal And Interior)	Grasslands	Hardwood Forests And Woodlands	Riparian	Scrub (Chaparral And Coastal Scrub)	Wetlands And Streams Or Rivers	IMPERIAL	LOS ANGELES	ORANGE	RIVERSIDE	SAN BERNARDINO	VENTURA
	Light-footed clapper rail *Rallus longirostris levipes*							X		X			X			X
	Yuma clapper rail *Rallus longirostris yumanensis*							X		X	X			X	X	
	California red-legged frog *Rana aurora draytonii*							X		X		X		X	X	X
	Mountain yellow-legged frog *Rana mucosa*						X	X		X		X		X	X	X
	Delhi sands flower-loving fly *Rhaphiomidas terminatus abdominalis*			X	X									X	X	
	Mohave ground squirrel *Spermophilus mohavensis*			X		X			X			X			X	
	California least tern *Sternula antillarum browni*	X			X							X	X			X
	Riverside fairy shrimp *Streptocephalus woottoni*					X		X		X			X	X		X
	American badger *Taxidea taxus*		X			X	X		X		X	X	X	X	X	X
	Two-striped garter snake *Thamnophis hammondii*	X						X		X		X	X	X	X	X
	Coachella Valley fringe-toed lizard *Uma inornata*			X	X									X		

TABLE 3.3-4 (Continued)
LISTED & KEY SPECIAL-STATUS PLANT SPECIES OCCURRENCE BY HABITAT & COUNTY

		Natural Habitats									County					
Mitigation Number	**Individual Listed And Special-Status Plant Species**	**Coastal Marine Resources**	**Conifer Forests And Woodlands**	**Desert Shrub And Woodland**	**Dunes (Beach And Dune-Coastal And Interior)**	**Grasslands**	**Hardwood Forests And Woodlands**	**Riparian**	**Scrub (Chaparral And Coastal Scrub)**	**Wetlands And Streams Or Rivers**	**IMPERIAL**	**LOS ANGELES**	**ORANGE**	**RIVERSIDE**	**SAN BERNARDINO**	**VENTURA**
	Island fox *Urocyon littoralis*	X							X			X				X
	Arizona Bell's vireo *Vireo bellii arizonae*							X		X	X	X	X	X	X	X
	Least Bell's vireo *Vireo bellii pusilus*							X		X						
	Island night lizard *Xantusia riversiana*	X			X		X		X			X				X
	Razorback sucker *Xyrauchen texanus*							X		X		X	X	X	X	X

SOURCE: Southern California Association of Governments, 2008 Regional Transportation Plan

TABLE 3.3-5
SPECIAL STATUS HABITAT AND COMMUNITIES OCCURRING WITHIN 150 FEET OF A FREEWAY, TRANSIT, OR FREIGHT RAIL PROJECT (ACRES)

	2008 RTP (highways, transit and freight rail)	No Project
Special Status Plant Habitat	22,592	15,357
Special Status Animal Habitat	24,225	16,388
Special Status Terrestrial Communities	619	436
Special Status Aquatic Communities	92	30

SOURCE: SCAG Analysis. (2007).

TABLE 3.3-6
NATURAL VEGETATION OCCURRING WITHIN 150 FEET OF A FREEWAY, TRANSIT, OR FREIGHT RAIL PROJECT (ACRES)

Vegetation Type	2008 RTP (acres affected)	No Project (acres affected)
Hardwood Forest and Woodlands	158	62
Conifer Forests and Woodlands	1,544	503
Desert Shrub and Woodlands	142	37
Grassland/Herbaceous	1,012	417
Shrub/Chaparral	4,731	726
Wetland	7	2
Total Acreage	7,594	1,747

SOURCE: SCAG Analysis. (2007).
California Department of Forestry and Fire Protection and U.S. Forest Service Fire (2007) for the Fire and Resource Assessment Program (FRAP), updated by Technology Associates.

For this assessment, if any measurable area of natural vegetation shown on **Map 3.3-1** was potentially displaced by a project, the impact to natural vegetation was considered significant. As **Table 3.3-6** demonstrates, there are approximately 7,594 acres of natural vegetation in the SCAG region that occur within 150 feet of a freeway, transit, or freight rail project in the 2008 RTP. The distribution of potential effects by vegetation categories, as discussed above, is shown in **Table 3.3-6**.

Site-specific analyses would be required to identify and minimize the potential impacts of each particular transportation and/or development project. However, overall, the 2008 RTP would substantially affect vegetation communities and habitat, some of which is utilized by species of special status. This impact would be significant.

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.

Mitigation Measures

MM BIO-1: Each transportation project shall assess displacement of habitat due to removal of native vegetation during route planning. Routes shall be planned in order to avoid and/or minimize removal of native vegetation.

MM BIO-2: When avoidance of native vegetation removal is not possible, each transportation project shall 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).

MM BIO-3: Individual transportation projects shall include offsite habitat enhancement or restoration to compensate for unavoidable habitat losses from the project site.

MM BIO-4: Pre-construction special status species surveys shall be conducted by a qualified biologist to verify presence or absence of species at risk. Species surveys 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 shall be avoided during construction to the extent feasible.

MM BIO-5: A Worker Awareness Program (environmental education) shall be developed and implemented to inform project workers of their responsibilities in regards to avoiding and minimizing impacts on sensitive biological resources.

MM BIO-6: An Environmental Inspector shall be appointed 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-7: A qualified wetland scientist shall 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 shall 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-8: 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 shall be restored and augmented, if impacts are temporary, at a 1.1:1 ratio (compensation acres to impacted acres). Permanent impacts shall be compensated for by creating or restoring habitats at a 3:1 ratio as close as possible to the site of the impact.

MM BIO-9: When work is conducted in identified sensitive habitat areas and/or areas of intact native vegetation, construction protocols shall require the salvage of perennial plants and the salvage and stockpile of topsoil (the surface material from 6 to 12 inches deep) and shall be used in restoring native vegetation to all areas of temporary disturbance within the project area.

MM BIO-10: If specific project area trees are designated as "Landmark Trees" or "Heritage Trees", then approval for removals shall be obtained through the appropriate entity, and appropriate mitigation measures shall be developed at that time, to ensure that the trees are replaced. Due to the close proximity of these areas to sensitive wildlife habitats, all mitigation trees will use only locally-collected native species.

MM BIO-11: Suitable habitat for listed vernal pool crustaceans shall be avoided to the extent feasible. If infeasible, impacts shall be mitigated in accordance with the Programmatic Biological Opinion (PBO) for vernal pool invertebrates, issued by the USFWS Sacramento Field Office in 1995. Surveys shall 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.

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-12: Projects within the range and within suitable habitat for the arroyo toad shall conduct surveys, with USFWS approval, in accordance with 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:

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-13: Projects within the range and within suitable habitat for the blunt-nosed leopard lizard shall 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 shall occur as this is a CDFG fully

protected species with no regulatory mechanism to authorize direct taking (killing) of individuals.

MM BIO-14: Projects within the range and within suitable habitat for the California red-legged frog shall 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 shall 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 shall contact USFWS to determine whether relocating any life stages is appropriate;
- The USFWS-approved biologist shall 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 shall be limited to the minimum necessary to achieve the project goal;
- If work sites require dewatering, the intakes shall be screened with a maximum mesh sizes of 5 millimeters;
- The USFWS-approved biologist shall 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-15: Projects within the range and within suitable habitat for the California tiger salamander shall 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 shall be implemented to further minimize adverse effects to the California tiger salamander.

- A pre-construction survey shall 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 shall be temporarily fenced and avoided.

- At locations where upland aestivation habitat is identified and cannot be avoided, aestivation burrows shall 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 shall 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 shall be avoided until the ponds have dried.

- Upon approval by the USFWS, preconstruction surveys to salvage and relocate individual California tiger salamanders shall include installation of drift fences and pitfall traps within construction sites to identify and relocate animals. Following removal of individuals, construction areas shall be fenced with temporary exclusionary silt fencing.

- Temporary impacts on upland aestivation habitat shall 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-16: Projects within the range and within suitable habitat for the Coachella Valley fringe-toed lizard shall 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-17: Projects within the range and within suitable habitat for the desert tortoise shall 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 shall be required to salvage and relocate individual desert tortoise out of harms. Following removal of individuals, construction areas shall 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-18: 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. Projects within the range and within suitable habitat for the two-striped garter snake shall conduct surveys in accordance with the best professional judgment of a qualified biologist. Preconstruction surveys of project impact areas shall be required to salvage and relocate individual two-striped garter snakes out of harms. Following removal of individuals, construction areas shall be fenced with temporary exclusionary silt fencing.

MM BIO-19: To avoid disrupting nesting Swainson's hawks, construction activities at known nesting locations shall 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 shall 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-20: No more than two weeks before construction in any given milepost, a survey for burrows and burrowing owls shall 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 (1993) which includes up to four surveys on different dates if there are suitable burrows present.

If occupied burrowing owl dens are found within the survey area, a determination shall 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 shall 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 shall 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 shall 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.

MM BIO-21: When working within 100 feet of salt or brackish marshland presence for the California black rail, California clapper rail, and Yuma clapper rail shall be assumed for either species during the period February 1- August 31 and construction shall be scheduled to begin no earlier than September 1 and end no later than January 31 to avoid potential impact on reproduction.

MM BIO-22: Projects within the range and within suitable habitat for the coastal California gnatcatcher shall 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 shall 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 shall 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-23: Projects within the range and within suitable habitat for the least Bell's vireo shall 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 shall 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 shall 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-24: Projects within the range and within suitable habitat for the southwestern willow flycatcher shall 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 shall 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 shall 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-25: Trees with unoccupied raptor nests (large stick nests or cavities) shall only be removed prior to March 1, or following the nesting season.

A survey to identify active raptor nests shall be conducted by a qualified biologist no more than two weeks before the start of construction at project sites from March 1 through July 30. Active raptor nests shall be located within 500 feet of the project to the extent feasible and assuming available authorized access.

- If an active raptor nest is found within 500 feet of the project a determination shall 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 shall be delayed within 300 feet of such a nest, or as determined by CDFG, 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.

Significance after Mitigation

Although many measures can be employed to minimize the impacts to habitat due to vegetation removal, for a regional plan of this scale, the impact remains **significant.**

Impact 3.3-2: The 2008 RTP would potentially contribute to the fragmentation of existing habitat, decreasing habitat patch sizes, reducing habitat connectivity, and causing direct injury to wildlife. The 2008 RTP includes new transportation corridors that may form barriers to animal migration or foraging routes.

Wildlife-roadway interactions often injure or kill wildlife (i.e., road kill). Additionally, the direct effects of road building and widening provide a barrier between existing habitat patches in the

SCAG region, serving to isolate habitat into smaller patches and thereby reduce their quality, especially for species with large home ranges.[10]

Where the barrier is effective, such disturbances can lead to further ecological disruptions from influenced prey-predator interactions and species alterations. The linear nature of transportation projects increases the potential extent and significance of this effect. Compared to today the RTP and committed projects included in the No Project condition would result in the following additional center lane miles of facilities: 78 freeway, 52 toll, 706 arterials/collectors and 325 HOV. Of this total, the 2008 RTP alone would add the following center lane miles of facilities: 48 freeway, 37 Toll, 348 arterials/collectors and 194 HOV.

The full implementation of the HSRT projects would involve the construction of 269 route miles. The CETAP corridors would include additional route miles of unknown alignment and width. Along with transit routes, these projects and the associated stations and other maintenance structures could also potentially disrupt biological resources.

Where entirely new roadways 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 slightly increase the existing barrier effect.

Table 3.3-7, below, provides the acreage of natural vegetation (and thus potential habitat) occurring within 0.25 miles from a 2008 RTP highway, transit or freight rail project. A much smaller area would actually be affected. The 0.25 mile zone on either side of the transportation projects was used to capture the effects that extend beyond the road itself, including changes in light, temperature, noise, fire regime, risk of predation and spread of invasive species. The intersections of regional transportation projects and vegetation communities are shown in **Map 3.3-1** in the Figure Chapter at the end of this document.

TABLE 3.3-7
NATURAL VEGETATION OCCURRING WITHIN 0.25 MILES OF A FREEWAY, TRANSIT, OR FREIGHT RAIL PROJECT (ACRES)

Vegetation Type	2008 RTP (acres affected)	No Project (acres affected)
Hardwood Forest and Woodlands	1,939	62
Conifer Forests and Woodlands	1,184	768
Desert Shrub and Woodlands	42,286	9,443
Grassland/Herbaceous	9,127	5,320
Shrub/Chaparral	15,868	7,507
Wetland	81	25
Total Acreage	70,704	23,174

SOURCE: SCAG Analysis. (2007).
California Department of Forestry and Fire Protection and U.S. Forest Service Fire (2007) for the Fire and Resource Assessment Program (FRAP), updated by Technology Associates.

[10] Frankham, R., J.D. Ballou and D.A. Briscoe, (2002). *Introduction to conservation genetics*. Cambridge University Press. Cambridge, MA.

Mitigation Measures

MM BIO-26: Individual transportation projects included in the 2008 RTP shall conduct site-specific analyses of opportunities to preserve or improve habitat linkages with areas on and off-site. Mitigation banking (opportunities to purchase, maintain, and/or restore offsite habitat) is one opportunity that project proponents and jurisdictions may pursue.

MM BIO-27: Each transportation project shall provide wildlife crossings/access at locations useful and appropriate for the species of concern.

MM BIO-28: Individual transportation projects shall include analysis of wildlife corridors during project planning. Impacts to these corridors shall be avoided and/or minimized.

MM BIO-29: Each transportation project included in the Plan shall use wildlife fencing where appropriate to minimize the probability of wildlife injury due to direct interaction between wildlife and roads. Inclusion of this mitigation measure shall 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.

Significance after Mitigation

Route planning to minimize habitat fragmentation impacts, wildlife crossings, on- and off-site habitat restoration and linkages would all reduce the impacts of habitat fragmentation, isolation, and direct injury to wildlife due to transportation projects. For some species, implementation of mitigation measures could also increase the degree of habitat fragmentation. At a regional scale, the fragmentation of habitat due to the large scale of the 2008 RTP would not be fully avoided or mitigated. The impact would remain **significant**.

Impact 3.3-3: The 2008 RTP includes new transportation facilities that could 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 such disturbances and will avoid or vacate areas where these factors become prevalent. Such losses might shift species abundance favoring more tolerable species over more sensitive species near well-used roadways. Often the more tolerable 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.

Table 3.3-7 provides estimates of the extent of potential increases in near-road human disturbances from the distribution and extent of proposed transportation facilities in naturally vegetated lands. These acreage calculations represent the amount of each vegetation community that occurs within 0.25 miles of a 2008 RTP project. A much smaller area would

actually be affected. The 0.25 mile zone on either side of the transportation projects was used to capture the effects that extend beyond the road itself, including changes in light, temperature, noise, fire regime, risk of predation and spread of invasive species.

Compared to today the RTP and committed projects included in the No Project condition would result in the following additional center lane miles of facilities: 78 freeway, 52 toll, 706 arterials/collectors and 325 HOV. Of this total, the 2008 RTP alone would add the following center lane miles of facilities: 48 freeway, 37 Toll, 348 arterials/collectors and 194 HOV.

Site-specific analyses would be necessary once the alignments for these projects are developed.

Overall, the impact would be significant.

Mitigation Measures

MM BIO-30: Individual transportation projects shall minimize vehicular accessibility to areas beyond the actual transportation surface. This can be accomplished through fencing and signage.

MM BIO-31: Each project shall establish litter control programs in appropriate areas, such as trash receptacles at road turnouts and view points.

MM BIO-32: Each project shall use road noise minimization methods, such as brush and tree planting, at heavy noise-producing transportation areas that might affect wildlife. Native vegetation should be used.

Significance after Mitigation

In many cases, the mitigation measures outlined above would avoid or minimize impacts to wildlife. However, at the regional scale, additional transportation projects would increase wildlife disturbance and the impact would remain **significant.**

Impact 3.3-4: The 2008 RTP projects would potentially damage natural vegetation and other habitat components as a result of trampling or off-road machinery during the construction phases for these projects. 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. Table 3.3-6 provides estimates of the natural vegetation occurring within 150 feet of a freeway, transit or freight rail project. Unmitigated, construction equipment has the potential to directly kill wildlife.

Compared to today the RTP and committed projects included in the No project condition would result in the following additional center lane miles of facilities: 78 freeway, 52 toll, 706 arterials/collectors and 325 HOV. Of this total, the RTP alone would add the following center lane miles of facilities: 48 freeway, 37 Toll, 348 arterials/collectors and 194 HOV.

Construction activities are more likely to have significant effects with greater duration or 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 described in Impact 3.3-7. Timing of the activity would also be important in situations where a critical life stage of an animal is affected (e.g., bird nesting).

Site specific analysis would be required to identify and minimize this impact for each individual project included in the 2008 RTP. However, at the regional scale, this impact would be significant.

Mitigation Measures

MM BIO-33: Each project shall be preceded by pre-construction monitoring to ensure no sensitive species' habitat would be unnecessarily destroyed (also see **BIO-4** through **BIO-10**). All discovered sensitive species habitat shall be avoided where feasible, or disturbance shall be minimized.

MM BIO-34: Each project shall schedule work to avoid critical life stages (e.g. nesting) of species of concern.

MM BIO-35: Each project shall fence and/or mark sensitive habitat to prevent unnecessary machinery or foot traffic during construction activities.

MM BIO-36: When removal and/or damage to sensitive species habitat are unavoidable during construction, each project shall replant any disturbed natural areas with appropriate native vegetation following the completion of construction activities. In the case of permanent losses to sensitive species habitat, mitigation shall also follow the offsite habitat compensation guidance (also see **BIO-4** through **BIO-25**).

Significance after Mitigation

Full implementation of each of these mitigation measures would avoid and/or minimize the construction impacts to **less than significant** levels.

Impact 3.3-5: The 2008 RTP projects would potentially create noise, smoke, lights and/or other disturbances to biological resources during construction phases for these 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. Project-level potential impacts and appropriate mitigation measures would need to be identified on a project-by-project basis. At the regional programmatic level, this would be a significant impact.

Mitigation Measures

MM BIO-37: Individual projects shall avoid and/or minimize construction activities that have the potential to expose species to noise, smoke, or other disturbances. Pre-construction surveys shall be conducted as appropriate to determine the presence of any species that would need to be protected from such an impact (see **BIO-4** through **BIO-10**).

MM BIO-38: Individual projects shall be scheduled to avoid construction during critical life stages or sensitive seasons (e.g. the nesting season; see **BIO-25**, and **BIO-11** through **BIO-24**).

Significance after Mitigation

Avoidance and minimization of impacts during construction, with special consideration for critical life stages and seasons of special status species would not reduce this impact to less than significant. The impact remains **significant**.

The operational impacts associated with transportation projects (i.e. those impacts not limited to the period of construction) are discussed in Impact 3.3-3 above.

Impact 3.3-6: The 2008 RTP includes projects that would potentially displace riparian or wetland habitat.

The significance of this impact would depend on the amount and kind of habitat removed. Removal of large riparian trees, for example, can especially 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. Table 3.3-6 estimates that approximately 7 acres of wetland occur within 150 feet of a freeway, transit, or freight rail projects in the 2008 RTP. **Table 3.3-8** (using a different source of information) estimates that 300 acres of wetland are located within 150 feet of RTP projects. Impacts to water quality are discussed in Section 3.12 Water Resources.

Approximately 300 acres of National Wetlands Inventory (NWI) mapped wetlands occur within 150 feet of a freeway, transit or freight rail project included in the 2008 RTP (**Table 3.3-8** below and **Map 3.3-2** in the map section at the end of this document).

TABLE 3.3-8
WETLAND ACREAGE OCCURRING WITHIN 150 FEET OF A FREEWAY, TRANSIT, OR FREIGHT RAIL PROJECT

2008 RTP (highways, transit and freight rail)	No Project
300	74

SOURCE: SCAG Analysis. (2007).
U.S. Fish and Wildlife Service. Division of Habitat and Resource Conservation (2007). *National Wetlands Inventory.* (Most recent regional data available).

Some small-scale wetlands, such as vernal pools, that are not included on the NWI map could also occur near planned transportation projects. Lane additions achieved through re-striping would have significantly less or no impact compared to lane additions and new roadways. At the regional level, the area of wetlands adjacent to 2008 RTP projects provides a good measure of the potential direct impacts.

Due to these potential results, the 2008 RTP would substantially affect riparian and wetland habitat. This impact would be **significant**.

Mitigation Measures

MM BIO-39: Construction through or adjacent to wetlands or riparian areas shall be avoided where feasible through route-planning.

MM BIO-40: Each transportation project shall avoid removal of wetland or riparian vegetation. Specific vegetation that is not to be removed shall be so marked during construction. Riparian vegetation removal shall be minimized.

MM BIO-41: Each transportation project shall 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.

MM BIO-42: When individual projects include unavoidable losses of riparian or aquatic habitat, adjacent or nearby riparian or aquatic habitat shall be enhanced (e.g. through removal of non-native invasive wetland species and replacement with more ecologically valuable native species).

Significance after Mitigation

The impact to wetlands and riparian areas would remain **significant**.

Impact 3.3-7: The 2008 RTP would potentially 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 which 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.

This impact would be significant.

Mitigation Measures

MM BIO-43: Individual projects near water resources shall 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. A more detailed description of BMPs is provided in Section 3.12 Water Resources.

MM BIO-44: Individual projects shall 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.

Significance after Mitigation

Full implementation of each of these mitigation measures would not avoid the siltation impacts. The impact remains **significant**.

Impact 3.3-8: Implementation of the 2008 RTP would not 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 are not in conflict with any of the projects included in the 2008 RTP, including the extension of SR-241 which is accounted for in the Southern Orange County NCCP conceptual reserve design alternatives (not yet adopted). The impact is less than significant.

Mitigation Measures

The 2008 RTP is not in conflict with any adopted Habitat Conservation Plan or Natural Communities Conservation Plan. No mitigation measures are necessary.

Significance after Mitigation

The impact is less than significant.

Cumulative Impacts 3.3-9: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization.

The 2008 RTP's influence on growth potentially contributes to following regional cumulatively considerable impacts (as described in Impacts 3.3-1 through 3.3-7 above):

- displacement of natural vegetation,
- damage to sensitive species habitat,
- habitat fragmentation,
- impacts to riparian and wetland habitats,
- construction and operational disturbances, and
- siltation.

The amount of new urbanized acreage (consuming previously vacant land) would be on the order of hundreds of thousands of acres. This degree of urban development is reasonably foreseeable; however, to assign this future development to precise locations would be speculative, such that it cannot be estimated which natural vegetation communities would be affected. Despite the inability to predict the acreage of each habitat type that may be affected, it is reasonable to expect that this future urban development would contribute to the same types (although on a larger scale) of impacts detailed in Impacts 3.3-1 through 3.3-8 above.

These indirect impacts on biological resources are associated with population, employment, and household growth forecast by SCAG, and they are considered a significant cumulative impact.

Mitigation Measures

The cumulative impacts to biological resources, due to the forecast urban development associated with the 2008 RTP, would be mitigated using the same measures detailed for Impacts 3.3-1 through 3.3-8, in addition to the following measure.

MM BIO-45: 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. [

Significance after Mitigation

The impacts to biological resources due to regional growth would be reduced through application of the mitigation measures; however, the 2008 RTP's accommodation of approximately 5.14 million people in the SCAG region by 2035 would contribute to cumulative impacts. Implementation of the 2008 RTP would have a cumulatively considerable contribution to urbanization, and, thus, the impact would remain **significant**.

Comparison with the No Project

In the No Project alternative, the population of the SCAG region grows by 6 million people, however no regional transportation investments are made above the existing programmed projects. The population distribution follows 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 or wetlands in the region. In **Tables 3.3-7**, and **3.3-8**, the No Project alternative is compared to the 2008 Plan impacts.

The proposed Plan's transportation-related impacts to biological resources would be greater than the No Project alternative.

Cumulative Impacts

The No Project alternative's cumulative impacts to biological resources due to urban development could be expected to be greater than those of the 2008 RTP because of the increased

consumption of vacant, open space/recreation and agricultural lands (655,000 acres compared to 200,000 acres under the Plan).

The No Project alternative's cumulative impacts to biology would be greater than those of the 2008 RTP.

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3.4 Cultural Resources

This section describes the cultural resources in the SCAG region, discusses the potential impacts of the 2008 RTP on these resources, identifies mitigation measures for the impacts, and evaluates the residual impacts.

Environmental Setting

The environmental setting describes the paleontological, archeological, and historic resources in the SCAG region.

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.[1] Fossils and their Associated Formations Geologic formations 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 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

[1] Bedrossian T. L. (1975). Vertebrate fossils and the history of animals with backbones. *California Geology, 28(11)*, 243-259.

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. If a sensitive formation bearing fossils can be found at the surface in an 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. Fossils of other types 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 & 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 3.4-1** identifies the general location of some of the more significant fossil localities for the SCAG region.

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 September 2007, over 54,021 archaeological resource locations have been identified in the SCAG region. They are distributed in the region as shown in **Table 3.4-2.** 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 3.4-2** lists these resources by county.

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

TABLE 3.4-1
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 Mommoth	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,
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
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

TABLE 3.4-1
SIGNIFICANT FOSSIL LOCALITIES IN THE SCAG REGION (Continued)

Location	Fossil Type	Formations
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: Due to the multiplicity of sources used to prepare this table, sources are included in the Appendices.

TABLE 3.4-2
ARCHAEOLOGICAL SITE DISTRIBUTION

County	Approximate Number of Archaeological Sites
Imperial	8,200
Los Angeles	3,752
Orange	1,672
Riverside	16,600
San Bernardino	22,000
Ventura	1,797
SCAG REGION TOTAL	**54,021**

SOURCES:
Imperial County: http://www.imperial.cc.ca.us/ivc-dm/did_you.htm September 7, 2007
San Bernardino County: Robin Laska, San Bernardino Archaeological Center, September 7, 2007
Riverside County: Kay H. White, Eastern Information Center, September 9, 2007
Los Angeles, Orange, and Ventura Counties: Stacy St. James, South Central Coastal Information Center, Sept 12, 2007

- 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 to 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.

Historical Resources

In contrast to archaeological sites, the location of historic sites is open to the general public and can be found in registries found at the federal, state, county, and city Levels. Additionally, registries are maintained by local and regional 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, 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 National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register 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 the register. There are 687 listings on the NRHP for the SCAG region.

National Historic Landmarks (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. There are 28 listings on the NHL for the SCAG region.

Table 3.4-3 summarizes the number of National Registered Places and Landmarks 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 National Register of Historic Places. Table CUL-2 includes the Landmarks.

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. There are 220 listings on the CHL for the SCAG region.

TABLE 3.4-3
NATIONAL REGISTERED PLACES AND LANDMARKS IN SCAG REGION (Summary Table)

County	Registered Places	Landmarks
Imperial	12	1
Los Angeles	426	20
Orange	108	2
Riverside	53	2
San Bernardino	54	2
Ventura	34	1
Total	**687**	**28**

SOURCE:
National Park Service, National Historic Landmarks Program. (2007.). National Historic Landmarks Survey. Retrieved September 2007 from http://www.nps.gov/nhl/designations/listsofNHLs.htm

National Park Service, National Register of Historic Places (n.d.). National Register Information System Database. Retrieved June 2007 from http://www.nps.gov/nr/research/nris.htm.

Table 3.4-4 contains a summary of the period and number of Historical Places and Landmarks in SCAG region, found on the California Historical Landmarks register.

TABLE 3.4-4
CALIFORNIA HISTORICAL LANDMARKS IN SCAG REGION (Summary Table)

County	Pre-European Period	Spanish Period	Mexican Period	American Period	Total
Imperial	0	4	1	9	14
Los Angeles	3	17	13	65	98
Orange	0	2	5	17	24
Riverside	4	5	5	15	29
San Bernardino	2	5	7	27	41
Ventura	0	7	3	4	14
Total	**9**	**40**	**34**	**137**	**220**

SOURCE: California Department of Parks and Recreation, Office of Historic Preservation. (n.d.). California state historic landmarks listed by county. Retrieved June 12, 2007 from http://ceres.ca.gov/geo_area/counties/lists/landmarks_county.html

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 281 are located in the SCAG region. **Table 3.4-5** contains a summary of the number of Points of Historical Interest found in each county in the SCAG region. Table CUL-3 in the Cultural Resource Technical Appendix lists the Points of Historical Interest located in the SCAG region.

TABLE 3.4-5
CALIFORNIA POINTS OF HISTORICAL INTEREST IN SCAG REGION (Summary Table)

County	Points of Historical Interest
Imperial	4
Los Angeles	64
Orange	21
Riverside	72
San Bernardino	119
Ventura	4
Total	**284**

SOURCE: California State Parks, Office of Historic Preservation. Patricia Ambacher, State Historian I. Registration Unit. September 24, 2007.

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, Santa Ana Historic Resources Commission (462 Historical Properties on their register and a historic district that is composed of many historic structures and has zoning protection for its structures), and Santa Monica Landmarks Commission (with a registry that contains 64 landmarks, 2 historic districts, and 1,350 potential historic resources having been designated or identified).

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 organization with a registry that contains 72 landmarks and 5 historic districts, for a total of 356 designated properties.

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:[2]

[2] Wallace, W. J. (1955). A suggested chronology for southern California coastal archeology. *Southwestern Journal of Anthropology 11(3),* 214-230.

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.

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, and 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 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 forts were located at San Diego, Santa Barbara, Monterey and San Francisco. The towns were founded at Los Angeles (1781), San Jose (1777) and Branciforte (1797), near Santa Cruz. The settlement at Branciforte failed but all the others 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 3.4-6** lists California Historical Landmarks from the Spanish Period.

Mexican Period (1822-1848)

When Mexico first gained its 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.

TABLE 3.4-6
CALIFORNIA HISTORIC LANDMARKS (CHL) OF THE SPANISH PERIOD (1769-1821)

CHL Number	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	Southeast 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
185	Serrano Adobe Site	South of Corona	1824
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	South 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	Portola Expedition Site	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. (n.d.). California state historic landmarks listed by county. Retrieved June 12, 2007 from http://ceres.ca.gov/geo_area/counties/lists/landmarks_county.html

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 Fores. The United States annexed California by the Treaty of Guadalupe Hidalgo in 1848, ending the Mexican War and beginning the American Period. **Table 3.4-7** 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 rancho owners to

TABLE 3.4-7
CALIFORNIA HISTORIC LANDMARKS (CHL) OF THE MEXICAN PERIOD (1822-1848)

CHL Number	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
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	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	Cucamonga	1839
528	Yucaipa Adobe	Yucaipa	1842
553	Rancho Camulos	2 miles east of Piru	1839
637	Catalina Adobe	Glendale	1830's
920	Casa de San Pedro	San Pedro	1823

TABLE 3.4-7 (Continued)
CALIFORNIA HISTORIC LANDMARKS (CHL) OF THE MEXICAN PERIOD (1822-1848)

CHL Number	Site Name	General Location	Year
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. (n.d.). California state historic landmarks listed by county. Retrieved June 12, 2007 from http://ceres.ca.gov/geo_area/counties/lists/landmarks_county.html

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 ranchos 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 1870's, 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 Twentieth 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 3.4-8** lists California Historical Landmarks from the American Period.

Regulatory Setting

Cultural resources in the six-county SCAG region include archaeological sites of prehistoric or historic origin, fossil deposits of paleontological importance, and standing structures with national, state, or local significance. These resources are regulated at the federal, state and local levels as discussed below.

TABLE 3.4-8
CALIFORNIA HISTORIC LANDMARKS (CHL) OF THE AMERICAN PERIOD (1849 TO PRESENT)

CHL Number	Site Name	General Location	Year
20	Parent Orange Tree	Riverside	1870
96	Mormon Road	West 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	South of Corona	1858
191	Yorba-Slaughter Adobe	South of Chino	1850-1853
193	Picacho Mines	North 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	Northeast of El Toro	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	West of Devore	1851
576	Santa Fe/Salt Lake Trail	North of San Bernardino	1917
577	Mormon Trail Monument	North of San Bernardino	1851
578	Stoddard-White Monument	North of San Bernardino	1849
579	Daly Road Monument	East of Rim Forest	1870
580	Alamitos 1	Long Beach	1921
590	Lang Station	East of Canyon Country	1876
617	Fort Benson	Colton	1856-1857
619	Holcomb Valley	Northeast of Big Bear	1860
622	Harry Wade Exit Route	Near Baker	1849
632	Old Short Cut	Angeles National Forest	1900
646	Grave of George Carlambo	Whittier	1867
649	Harry Wade Exit Route	30 miles north of Baker	1849

TABLE 3.4-8 (Continued)
CALIFORNIA HISTORIC LANDMARKS (CHL) OF THE AMERICAN PERIOD (1849 TO PRESENT)

CHL Number	Site Name	General Location	Year
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	West 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
756	Sycamore Tree	4 miles E of Santa Paula	1846
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	West of Winterhaven	1915?
847	Ventura County Courthouse	Ventura	1913
859	Von Schmidt Boundary	North 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	North 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
943	Cornelius and Mercedes Jenson Ranch	Rubidoux	1854
947	Reform Schol Juvenile Offenders (F.C. Nelles)	Whittier	1891
948	Site of Blythe Intake	North of Blythe	1877
950	U.S. Rabb Experimental Station	Fontana	1928
959	Balboa Pavilion	Balboa	1905
960	Los Angeles Memorial Coliseum	Los Angeles	1923

TABLE 3.4-8 (Continued)
CALIFORNIA HISTORIC LANDMARKS (CHL) OF THE AMERICAN PERIOD (1849 TO PRESENT)

CHL Number	Site Name	General Location	Year
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. (n.d.) California state historic landmarks listed by county. Retrieved June 12, 2007, from http://ceres.ca.gov/geo_area/counties/lists/landmarks_county.html

Federal Agencies And Regulations

Federal Historic Preservation Laws

There are a number of federal laws and portions of laws, regulations, and Presidential executive orders that pertain to the preservation of the Nation's cultural heritage. These laws were developed over the course of the 20th century, beginning with the protection of cultural sites on federal lands. Today, many aspects of the nation's cultural heritage are recognized, protected, and interpreted in national parks, other public lands, and communities across the nation.

The following are key laws related to the preservation of our cultural heritage: American Indian Religious Freedom Act of 1978 (42 USC 1966); Antiquities Act of 1906 (16 USC 431-433); Archeological and Historic Preservation Act of 1974 (16 USC 469); Archaeological Resources Protection Act of 1979 (ARPA) (16 USC 470); Historic Sites Act of 1935 (16 USC 461-467); National Environmental Policy Act of 1969 (NEPA) (42 USC 4321-4347); National Historic Preservation Act of 1966 (NHPA), (16 USC 470); Native American Graves Protection and

Repatriation Act (NAGPRA), (25 USC 3001-3013); Reservoir Salvage Act of 1960 (16 USC 469); and United States Department of Transportation Act of 1966 (Section 4[f]), (49 USC 303).

Implementing these laws are the following: Advisory Council on Historic Preservation, Protection of Historic and Cultural Properties (36 CFR 800); National Register of Historic Places (36 CFR 60); National Register of Historic Places, Determinations of Eligibility for Including in the National Register of Historic Places (30 CFR 63); US Department of Interior, NAGPRA Regulations (43 CFR 10); US Department of Transportation, Section 4(f) Regulations (23 CFR 771); US Secretary of Interior Standards for Treatment of Historic Properties (36 CFR 68), and Executive Order 11593, Protection and Enhancement of the Cultural Environment, 1971.

National Environmental Policy Act (NEPA)

NEPA *(42 USC 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.

National Historic Preservation Act (NHPA)

The NHPA 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 Antiquities Act of 1966, 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 Archeological 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.

Historic Sites Act of 1935 (HSA)

The HSA *(16 USC 461-467)* 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 under Executive Order 11593 and NEPA with those of Section 106.

American Indian Religious Freedom Act (AIRFA) and Native American Graves Protection and Repatriation Act (NAGPRA)

AIFRA (42 USC 1996) became law on August 11, 1978 and recognizes that Native American religious practices, sacred sites, and sacred objects have not been properly protected under other statutes. It establishes as national policy that traditional practices and beliefs, sites (including right of access), and the use of sacred objects shall be protected and preserved.

The remains of Native Americans are protected by NAGPRA (25 USC 3001 et seq.), which became law on November 11, 1990, and required that the excavation and disposition of remains is supervised by a designated “most likely descendent” as determined by the Native American Heritage Commission (see discussion of State Regulations below).

Archeological and Historic Preservation Act (16 USC 469-469c-2) became law on June 27, 1960. The purpose of this Act is the preservation of historical and archeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of flooding, the building of access roads, the erection of workmen’s communities, the relocation of railroads and highways, and other alterations of the terrain caused by the construction of a dam by any agency of the United States, or by any private person or corporation holding a license issued by any such agency or any alteration of the terrain caused as a result of any federal construction project or federally licensed activity or program.

State Agencies and Regulations

Certain portions of California law are specifically concerned with the protection of cultural resources and archaeological human remains located on public or private land, including CEQA (Public Resources Code Section 21000); various Public Resources Code Sections 5020, 5029, 5097 including, but not limited to State-owned Historical Resources, California Register of Historical Resources, Archeological, Paleontological, and Historical Sites and Native American Historical, Cultural, and Sacred Sites; and Governor’s Executive Order W-26-92.

Definition

CEQA (Public Resource Code 21000 et seq. and CCR 15000 et seq.) was enacted in 1970 and is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. The impetus for CEQA can be traced to the passage of the first federal environmental protection statute, NEPA. The basic goal of CEQA is to develop and maintain a high-quality environment now and in the future, while the specific goals of CEQA are for California's public agencies to: identify the significant environmental effects of their actions, and, either avoid those significant environmental effects, where feasible or mitigate those significant environmental effects, where feasible. CEQA applies to certain activities of state and local public agencies. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a "project."

California Coastal Act (CCA)

The CCA (Public Resources Code, Sections 30000 et seq.) includes protection of archeological resources into Land Conservation Plans that regulate land uses within the coastal zone.

Other Provisions of Public Resources Code (PRC)

The State's cultural resources are regulated by the PRC. The PRC defines cultural preserves as "distinct areas of outstanding cultural interest" located in the State Park System for the protection of sites, buildings, or zones, which represent significant places or events in the flow of human experience in California. A historic resource includes, but is not limited to, "any object, building or structure, site, area, or place which is historically or archaeologically significant," or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. Section 5097.5 of the PRC specifically defines unauthorized excavation, removal, destruction, etc., of archaeological, paleontological or historical features, on "Public Lands," as a misdemeanor.

The California Administrative Code includes the following regulations, Title 14, State Division of Beaches and Parks, Section 4307: Archaeological Features: No person shall remove, injure, disfigure, deface, or destroy any object of paleontological, archaeological or historical interest or value. The California Penal Code, Title 14, part 1, Section 622 1/2 provides that injury, etc. to an object of archaeological or historical interest is punishable as a misdemeanor.

State Office of Historic Preservation (SHPO)

SHPO implements preservation laws regarding historic resources, and is responsible for the California Historic Resources Inventory (CHRI), which uses the National Criteria for listing resources significant at the national, state, and local level.

Native American Heritage Commission (NAHC)

Section 50907.9 of the PRC 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 Agencies and Regulations

In addition to federal and state regulations, cities and counties in the SCAG region may also provide regulatory protection and advisement regarding cultural resources. The California General Plan requires seven elements. One of these elements is a conservation element. Many jurisdictions incorporate policies related to cultural and historical resources into this element. Other jurisdictions incorporate into their General Plans optional elements dealing with cultural or historic preservation issues.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the 2008 RTP on paleontological, archeological, and historic resources in the SCAG region.

Comparison with the No Project

The analysis of cultural resources includes a comparison of the expected future conditions with 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 (which is based on comparison to existing conditions); however, it provides a meaningful perspective on the effects of the 2008 RTP.

Determination of Significance

The methodology for determining the significance of these impacts compares the future Plan conditions to the existing setting, as required by CEQA Guidelines §15126.2(a). The known archaeological and historical resources located within the SCAG region were evaluated using the criteria set forth by the Office of Historic Preservation, the California Register of Historic Resources, and CEQA Guidelines. The research analysis was limited to state and federally recognized historic resources and landmarks, and does not include landmarks of local level importance. The location of known archaeological sites is considered confidential information for archaeological scholars only and is not included in this document.

Significance Criteria

In accordance with CEQA Guidelines, including §*15064.5 Determining the Significance of Impacts on Historical and Unique Archaeological Resources* and *Appendix G*, the proposed Plan would have a significant impact on cultural resources if implementation were to:

- Cause a substantial adverse change in the significance of an historical resource pursuant to §15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

A substantial adverse change is defined as physical demolition, destruction, relocation or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired (CEQA Guidelines § 15064.5);

Impacts and Mitigation Measures

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. The precise location of archaeological sites is considered to be confidential, and professional archaeologists are prohibited from disclosing this information. Paleontological sites are also numerous in the SCAG region. Although the location of paleontological sites is not considered confidential, it is considered privileged, and therefore the exact locations are not disclosed here. 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 affects to buildings within the proposed project area, or through indirect affects 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 (see Tables 3.4-3, 3.4-4, 3.4-5); 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.

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.

Impact 3.4-1: Construction of projects from the 2008 RTP could cause a substantial adverse change in the significance of a historical resource.

Undiscovered historic resources, refers to those structures that exist whose historic value has not previously been assessed or recognized. In more remote areas, structures of historic importance may not be currently listed on state or federal registers. In these instances, it is important to treat these structures as historic resources, if they meet the criteria that would make them eligible for the National Register of Historic Places 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 which entail the development of new lanes and right-of-way acquisition. Improvements proposed in existing "rights of way," such as HOV lanes, HOT lanes, new bus-ways 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. However, intensification of land uses along established transit corridors where structures of architectural or historical significance may be located could result in significant impact to historic built resources. Several of the planned projects include the construction of additional lanes and highway arterials. These projects 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 which may damage the exterior of historic buildings. This impact would be **significant**.

Mitigation Measures

MM-CUL.1: As part of the appropriate environmental review of individual projects, the project implementation agencies shall identify potential impacts to historic resources. A record search at the appropriate Information Center shall be conducted to determine whether the project area has been previously surveyed and whether historic resources were identified.

MM-CUL.2: If indicated as necessary by a records search, prior to construction activities, project implementation agencies shall obtain a qualified architectural historian to conduct historic architectural surveys as recommended by the Archaeological 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 cultural resources within 1,000 feet of the improvement.

MM-CUL.3: The project implementation agencies shall comply with Section 106 of the NHPA if 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. This mitigation measure may include, but are not limited to the following:

- The project implementation agencies shall carry out the maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation or reconstruction of any impacted historic resource, which shall be conducted in a manner consistent with the Secretary of the Interior's Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings.

MM-CUL.3: Where feasible, the project implementation agencies shall employ design measures to avoid historical resource areas.

MM-CUL.3: Where feasible, noise buffers/walls and/or visual buffers/landscaping or some other material shall be constructed to preserve the contextual setting of significant built resources.

In some instances, the following mitigation measure may be appropriate:

MM-CUL.4: The project implementation agencies shall 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 significance.

Significance after Mitigation

Due to the size and potentially large number of historic properties listed that could be disturbed as a result of the RTP projects, impacts to historic resources would remain **significant**.

Impact 3.4-2: Construction of projects from the 2008 RTP could 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 and/or paleontological 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.
- It has yielded, or may be likely to yield, information important to the prehistory or history of California.

The 2008 RTP 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, new bus-ways and capacity enhancement facilities, mixed flow lanes, 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 materials, if it would entail brush clearing, grading, trenching, excavation, and/or soil removal of any kind, in an area not previously used as a paved transportation facility.

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. Since this document analyzes impacts to cultural resources on a program level only, project-level analysis of impacts will also be necessary. This impact would be **significant**.

Mitigation Measures

MM-CUL.5: As part of the appropriate environmental review of individual projects, the project implementation agencies shall consult with the 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-CUL.6: Prior to construction activities, the project implementation agencies shall 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-CUL.7: As necessary prior to construction activities, the project implementation agencies shall 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 cultural resources.

MM-CUL.8: If the record search indicates that the project is located in an area rich with cultural materials, the project proponent shall 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-CUL.9: Construction activities and excavation 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. The project implementation agencies 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-CUL.10: Project implementation agencies shall stop construction activities and excavation in the area where cultural resources are found until a qualified archaeologist can determine the importance of these resources.

Significance after Mitigation

Due to the size and potentially large number of archaeological sites that could be disturbed as a result of the combined projects, impacts to archaeological resources would remain **significant.**

Impact 3.4-3: Construction of projects from the 2008 RTP could directly or indirectly destroy unique paleontological resources or sites or unique geological features.

Excavation related to construction of projects proposed in the 2008 RTP 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. Construction activities for each transportation improvement would not result in excavation beyond 150 feet on either side of any improvement. Excavation and soil removal of any kind, irrespective of depth, has the potential to yield resources of paleontological significance. This makes it difficult to predict which areas are paleontologically sensitive. Similar to Impact 3.4-2, construction and excavating activities relating to this project pose a significant impact to paleontological materials.

The location of paleontological localities is considered privileged information in order to protect the integrity of geologic formations and therefore not disclosed here. However, fossiliferous geologic formations that exist in each county are identified in the text.

New roadways and transit facilities can also permanently alter unique geologic features, particularly in canyons, coast lines, and mountain passes. However, most of the projects proposed in the 2008 RTP would occur in urbanized portions of the SCAG region, or in existing transportation corridors. Nonetheless, new lanes and transit projects require earthwork that would impact existing natural and unique geologic features and paleontological resources. This impact would be **significant**.

Mitigation Measures

MM-CUL.11: As part of the appropriate environmental review of individual projects, the project implementation agencies shall obtain a qualified paleontologist to identify and evaluate paleontological resources where potential impacts are considered high; the paleontologist shall also conduct a field survey in these areas.

MM-CUL.12: Construction activities shall 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-CUL.13: 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 shall be retained (or required to be retained) by the project implementing agency 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 monitor shall 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 shall 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-CUL.14: Where practicable, routes and project designs that would permanently alter unique geologic features shall be avoided.

Significance after Mitigation

Due to the large number of paleontological localities and unique geologic features found throughout the SCAG region that could be disturbed as a result of the 2008 RTP, impacts to paleontological resources would remain significant.

Impact 3.4-4: Construction of projects from the 2008 RTP 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 likely 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 not result in excavation beyond 150 feet on either side of any improvement and are considered to potentially yield a significant impact relative to the discovery of 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, as previously discussed, which was enacted to provide for the protection of Native

American graves, as well as: culturally affiliated items, associated funerary objects, unassociated funerary objects, sacred objects, and objects of cultural patrimony.

The 2008 RTP transportation projects have the potential to yield previously undiscovered human remains, because they could take place in previously undisturbed or under-disturbed areas. Excavation and soil removal of any kind, irrespective of depth, has the potential to yield human remains. This impact would be **significant**.

Mitigation Measures

MM-CUL.15: As part of environmental review of individual projects, project implementation agencies, 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, shall 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; and

MM-CUL.16: If the remains are of Native American origin:

- The coroner will contact the Native American Heritage Commission in order to ascertain the proper descendants from the deceased individual. The coroner shall 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 was unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the commission, in which case
- The landowner or his authorized representative shall 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 NAHC is unable to identify a descendent;
    - The descendant identified fails to make a recommendation; or
    - The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the NAHC Commission fails to provide measures acceptable to the landowner.

Significance after Mitigation

The excavation and construction that may be necessary for some projects in the 2008 RTP 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 3.4-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional impacts to existing historic resources and previously undisturbed and undiscovered cultural resources, as described in Impacts 3.4-1 through 3.4-4 above. This impact would be cumulatively considerable.

The amount of new urbanized acreage (consuming previously vacant, open space/recreation and agricultural land) from transportation and land use policies in the 2008 RTP would be approximately 200,000 acres (compared to up to 655,000 acres under the No Project Alternative). This degree of urban development is reasonably foreseeable; however, to assign this future development to precise locations would be speculative, such that it cannot be estimated where cultural resources would be affected. Despite the inability to predict the acreage of previously undisturbed land that may be affected, it is reasonable to expect that this future urban development would contribute to the same types of impacts detailed in Impacts 3.4-1 through 3.4-4 above.

These effects are considered a **significant cumulative** impact.

Mitigation Measures

The cumulative impacts to cultural resources, due to the forecast urban development associated with the 2008 RTP, would be mitigated using the same measures detailed for Impacts 3.4-1 through 3.4-4, in addition to the following measure.

MM-CUL.17: Future impacts to cultural resources shall be minimized through cooperation, information sharing, and SCAG's ongoing regional planning efforts. Resource agencies, such as the Office of Historic Preservation, shall be consulted during this process.

Significance after Mitigation

The impacts to cultural resources due to regional scale growth would be reduced through application of the mitigation measures, however the 2008 RTP's accommodation of approximately 5.14 million people to the SCAG region by 2035 would contribute to cumulative impacts. Impacts to cultural and paleontological resources from the 2008 RTP would be cumulatively considerable.

Comparison with the No Project

In the No Project alternative, the population of the SCAG region would grow by 5.14 million people (the same as under the Plan), however no regional transportation investments would be made above the existing programmed projects. The population distribution follows 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, resulting in fewer areas that would be impacted by excavation and construction activities due specifically to transportation. In **Table 3.4-9**, the No Project alternative is compared to the 2008 Plan impacts to previously undisturbed areas within the SCAG region (under the Plan the No Project **and** plan impacts would occur, the table shows acreage within 150 feet of Plan projects and No Project freeways etc., The two columns should be added to show total impacts in 2035 under the Plan).

The proposed Plan's transportation-related impacts to cultural resources would be greater than the No Project alternative.

TABLE 3.4-9
UNDISTURBED AREAS OCCURRING WITHIN 150 FEET OF A FREEWAY, TRANSIT, OR FREIGHT RAIL PROJECT (ACRES)

	2008 RTP (highways, transit and freight rail)	No Project
Total Acreage	11,700	3,200
% of 2008 RTP Affected Acres	100	27

SOURCE: SCAG Analysis. (2003).
UCSB. (1999). GAP Analysis. (Best and most recent regional level data).

Cumulative Impacts

The No Project Alternative is expected to accommodate the same increase in total population as the proposed 2008 Plan. The 2008 Plan focuses development in existing and emerging centers, along transportation corridors, promotes transit-oriented and mixed use development and improves the regional jobs-housing balance. These measures would help decrease the rate of consumption and disturbance of natural lands. Some of these measures are also present in the No Project Alternative such as supporting centers-based development, re-development and in-fill where feasible. Under the No Project alternative, the region would continue to grow without the growth strategies included in the 2008 RTP. SCAG's analysis estimates that approximately 655,000 acres of vacant, open space/recreation and agricultural land would be consumed under the No Project Alternative, compared to approximately 200,000 under the Plan. Although the proposed Plan also includes additional transportation projects that facilitate access to natural lands that would be less accessible or inaccessible with the No Project Alternative. This improved accessibility could facilitate population and economic growth to areas of the region that are currently not developed. It is nevertheless expected that the 2008 Plan would consume less acreage of vacant land than the No Project alternative.

The No Project alternative's cumulative impacts to cultural resources due to urban development would be expected to be similar to those of the 2008 RTP. Both scenarios include the same increases in population, households and employment. Future urbanization would be expected to impact existing historic resources and undisturbed areas that may contain cultural resources.

The No Project alternative's cumulative impacts to cultural resources would be similar to those of the 2008 RTP.

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3.5 Energy

This section describes existing energy supply and consumption trends within the SCAG region, identifies the potential impacts of the RTP on energy consumption, includes mitigation measures for the impacts, and evaluates the residual impacts.

Environmental 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 20 percent of the state's greenhouse gas emissions.[1]

Petroleum products represent approximately 40 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.[2] Current annual consumption in the U.S. is approximately 100.7 quadrillion (10^{15}) British thermal units (Btu)[3], which represents about 22 percent of the world's energy consumption.[4]

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.[5] In 2004, Californians consumed about 15.4 billion gallons of gasoline and 2.8 billion gallons of diesel fuel an increase of nearly 50 percent over the last 20 years.[6] Electricity generation requires nearly half of the

1 California Environmental Protection Agency, Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006.

2 United States Department of Energy, Energy Information Administration. U.S. Primary Energy Consumption by Source and Sector, 2006. Retrieved October 29, 2007, from http://www.eia.doe.gov/emeu/aer/pdf/pecss_diagram.pdf

3 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. 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.

4 United States Department of Energy, Energy Information Administration. (21 September 2007). International Energy Annual 2004, Table E.1 World Total Primary Energy Consumption, 1980-2005. Retrieved October 12, 2007 from http://www.eia.doe.gov/pub/international/iealf/tablee1.xls

5 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

6 California Energy Commission, Integrated Energy Policy Report, (2005, November 21) page 20.

natural gas consumed in California.[7] Nearly all of the state's transportation system is fueled currently by fossil fuels.[8]

California consumes more energy than any other state in the U.S. except Texas. However, in terms of energy consumption per person, California ranks 49th among the 51 states, including the District of Columbia.[9] Current annual energy consumption in California (for all purposes including transportation) is approximately 8,364,592 billion Btu, which represents approximately 8.3 percent of the nation's total energy consumption.[10]

Petroleum

The United States consumes approximately 25 percent of the world's oil, while making up 5 percent of the world's population.[11] California consumes approximately 2 million barrels of oil per day or 2 percent of the world's oil consumption.[12] The U.S. imports approximately 60 percent of its oil.[13] Canada provides the largest share of imported petroleum, with 1.8 million barrels/day, followed by Mexico with 1.6 million barrels/day and Saudi Arabia with 1.4 million barrels/day.[14]

California as a state ranks 4th in crude oil reserves and crude oil production in the U.S. California also ranks 1st in gasoline consumption and jet fuel consumption and 3rd in distillate fuel consumption.[15] 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 has increased dramatically in the past twenty years. For example, in 1994, California imported 49 million barrels of oil from foreign sources and in 2006 California imported 295 million barrels from foreign sources, as shown in **Figure 3.5-1**. Of the total 655 million barrels of oil refined in 2006, 38.8 percent came from in-state oil production, 16.2 percent came from Alaska and 45.0 percent came from foreign sources. As shown in the figure below, foreign sources of oil have surpassed Alaskan supplies and are reaching California supply levels.[16]

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7 California Energy Commission, Integrated Energy Policy Report, (2005, November 21) page 123.

8 California Energy Commission, Alternative Transportation Fuels, Retrieved October 29, 2007 from http://www.energy.ca.gov/afvs/vehicle_fact_sheets/index.html

9 United States Department of Energy, Energy Information Administration. Table R.2 Energy Consumption by Source and Total Consumption per Capita, Ranked by State, 2004. Retrieved October 29, 2007 from http://www.eia.doe.gov/emeu/states/sep_sum/plain_html/rank_use_per_cap.html

10 United States Department of Energy, Energy Information Administration. State Energy Profiles (October 25, 2007). Retrieved October 29, 2007 from http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=CA

11 United States Census Bureau. Retrieved January 31, 2007 from http://www.census.gov/. United Stated Department of Energy, Energy Information Administration (July 2007). Basic Petroleum Statistics. Retrieved October 29, 2007 from http://www.eia.doe.gov/neic/quickfacts/quickoil.html

12 United States Department of Energy, Energy Information Administration. State Energy Consumption, Price and Expenditure Estimates. Total Petroleum Consumption Estimates by Sector, 2005, Retrieved October 29, 2007 from http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_use_pa.html

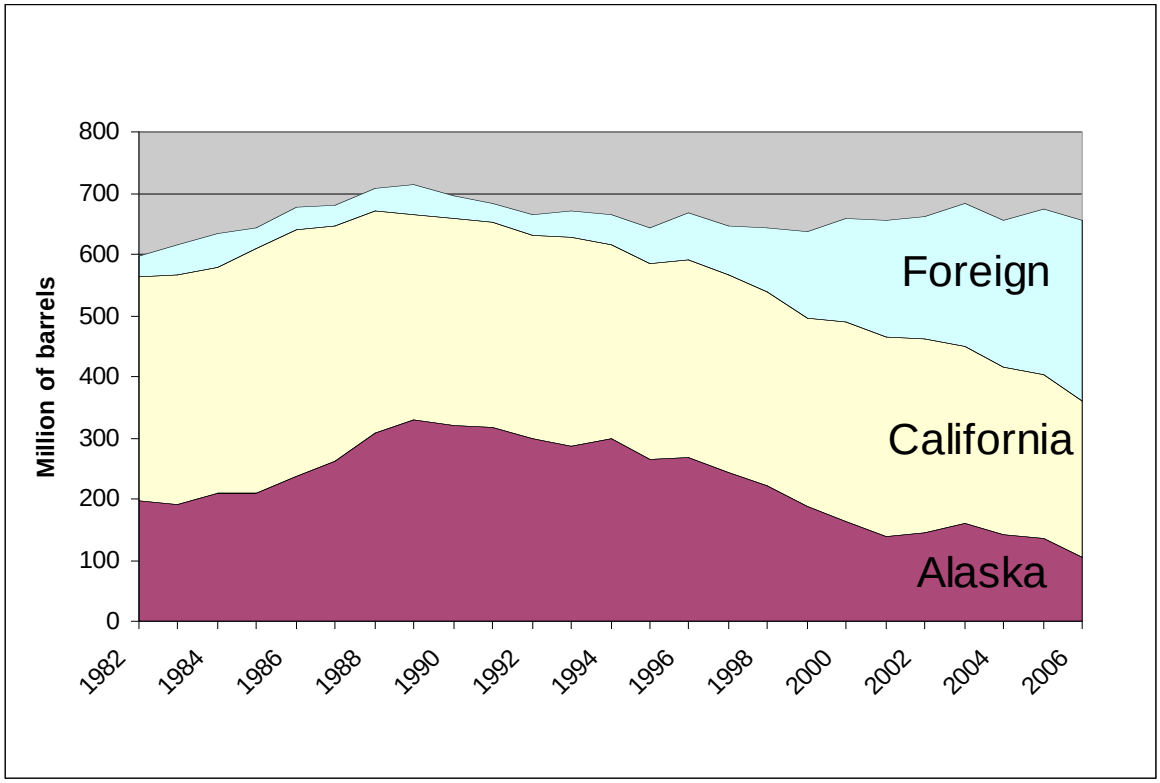
13 United States Department of Energy, Energy Information Administration. (July 2007) Basic Petroleum Statistics. Retrieved October 29, 2007 from http://www.eia.doe.gov/neic/quickfacts/quickoil.html

14 United States Department of Energy, Energy Information Administration. U.S. Crude Oil Imports 2006. Retrieved October 29, 2007 from http://tonto.eia.doe.gov/dnav/pet/pet_move_impcus_a2_nus_epc0_im0_mbblpd_a.htm.

15 United States Department of Energy, Energy Information Administration, Petroleum Profile, California; October 2007 http://tonto.eia.doe.gov/oog/info/state/ca.html, accessed October 29, 2007

16 California Energy Commission, Oil Supply Sources To California Refineries, Retrieved October 29, 2007 from http://www.energy.ca.gov/oil/statistics/crude_oil_receipts.html, Oil Supply Sources To California Refineries

FIGURE 3.5-1
OIL SUPPLY SOURCES IN CALIFORNIA 1982 – 2006



SOURCE: California Energy Commission, Oil Supply Sources to California Refineries. Retrieved October 29, 2007 from http://www.energy.ca.gov/oil/statistics/crude_oil_receipts.html

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.[17]

The International Energy Agency reported in July 2007 that the world will face an oil supply "crunch" in the next five years. This is due to faster than expected falls in supply in mature areas

[17] Udall, R. and Andrews, S. (1999, January). When will the joy ride end? A petroleum primer. Hubbert Center Newsletter, 99(1),
1-8.

such as the North Sea and Mexico and new prospects in Russia are experiencing long delays. As a result, oil supply will increase approximately 1 percent annually while demand will grow at an annual rate of 2.2 percent.[18] The world supply crunch will impact California and the SCAG region. A fuel shortage will take a toll on California's economy as consumers are spending more of their household income on gasoline than ever before, particularly with development patterns that create long commutes without access to public transportation. 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. Since September of 2004, the monthly average price of gasoline has increased by more than 35 cents per gallon, costing consumers an additional $6.1 billion for gasoline.[19]

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 U.S., the Rocky Mountains, and Canada. The remainder is produced in California.[20] California's natural gas supply sources are shown in **Figure 3.5-2**.[21]

The SCAG region is served primarily by the investor-owned Southern California Gas Company, a unit of Sempra Energy. A small portion of the region is served by a municipal gas utility, Long Beach Energy (part of the City of Long Beach). The Southern California Gas Company, a privately owned utility company, provides natural gas service throughout the SCAG region, except for the City of Long Beach, the southern portion of Orange County, and portions of San Bernardino County. The service area for Long Beach Energy, a municipal utility and natural gas supplier owned and operated by the City of Long Beach, includes the cities of Long Beach and Signal Hill, and sections of surrounding communities including Lakewood, Bellflower, Compton, Seal Beach, Paramount, and Los Alamitos. Long Beach's customer load profile is 50 percent residential and 50 percent commercial/industrial. The majority of Long Beach supplies are purchased at the California border, primarily from the Southwestern United States. 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.

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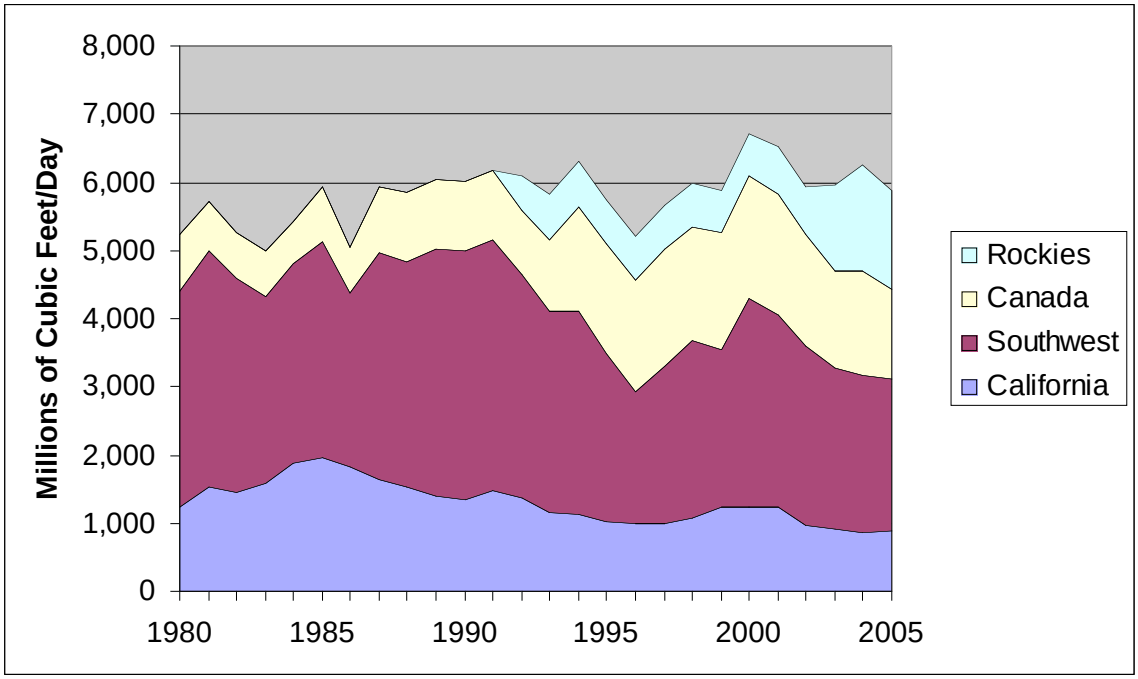
18 International Energy Agency (July 2007). Medium Term Oil Market Report

19 California Energy Commission. (November 2005). Integrated Energy Policy Report. CEC-100-2005-007CMF. Retrieved September 26, 2007 from http://www.energy.ca.gov/2005publications/CEC-100-2005-007/CEC-100-2005-007-CMF.PDF

20 California Energy Commission, California Natural Gas Supply by Source. Retrieved October 29, 2007 from http://www.energy.ca.gov/naturalgas/statistics/gas_supply_by_source.html

21 California Energy Commission. (2006, August 30). California Natural Gas Supply by Source. Retrieved October 29, 2007 from http://www.energy.ca.gov/naturalgas/statistics/gas_supply_by_source.html

FIGURE 3.5-2
NATURAL GAS SUPPLY SOURCES 1980 – 2005



SOURCE: California Energy Commission, California Natural Gas Supply By Source. Retrieved October 29, 2007 from http://www.energy.ca.gov/naturalgas/statistics/gas_supply_by_source.html

There is also a tightening of natural gas markets due to decreasing supplies and growing demand for natural gas, which makes up 25 percent of the nation's energy use and is by comparison, a relatively clean source of electricity compared to sources such as coal. The U.S. and California will lose a major source of natural gas imports by 2010 due to the decline of Canada's largest producing basin, the Western Sedimentary Basin, coupled with an approximately 2 percent projected average annual growth in Canada's domestic consumption.[22] Although some research has shown a world peak in natural gas occurring a decade after oil, the U.S. and California could experience the effects sooner. For example, natural gas has become the preferred source of electricity generation, supplying over 40 percent of California's power.[23] Also, unlike oil, it is more difficult and expensive to import replacement natural gas from overseas − as it has to be liquefied for transport and then re-gasified for distribution.[24] An increase in natural gas prices would negatively affect the economy, potentially leading to reduced sales and employment.[25]

22 United States Department of Energy, Energy Information Administration. International Energy Outlook 2006 (June 2006) pp. 37 – 49. Retrieved October 29, 2007 from http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2006).pdf

23 California Energy Commission, 2006 Gross System Electricity Production. (April 2007) CEC-300-2007-007. Retrieved October 29, 2007 from http://www.energy.ca.gov/electricity/gross_system_power.html

24 City of Portland Office of Sustainable Development, Bureau of Planning, and Department of Transportation. Peak Oil Task Force Briefing Book (July 25, 2006).

25 Global Insight. (February 2006). The Impacts of Natural Gas Prices on the California Economy: Final Report. Retrieved September 27, 2007 from http://www.globalinsight.com/publicDownload/genericContent/natgasfullstudy.pdf

Electricity

Local electricity distribution service is provided to customers within the SCAG region by both Investor-Owned Utilities (IOUs) and Publicly Owned Utilities (POUs). The two IOUs operating in the region are Southern California Edison Company (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. The Southern California Edison Company delivers 78 percent of the retail electricity sales to residents and businesses in the SCAG region.[26] SDG&E provides local distribution service to the southern portion of Orange County.[27] 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.[28] 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.[29]

Alternative Energy Sources

Alternative Fuels

Alternative fuels, as defined by the Energy Policy Act of 1992 (EPAct), 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.[30] 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. The following descriptions of alternative fuels are from the U.S. Department of Energy's Alternative Fuels Data Center website. **Map 3.5-1**, Alternative Fuel Facilities, identifies the location of biodiesel, hydrogen, natural gas and propane facilities in the SCAG region.

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26 The California Energy Commission's 2006-2016 Demand Forecast (CEC-400-2005-034-SF-ED2) states that the SCE planning area data includes the following utilities: Anaheim, Anza, Azusa, Banning, Colton, Metropolitan Water District, Riverside, SCE, Southern California Water, USBR-Parker Davis, Valley Electric, Vernon. The municipal utilities including Burbank, Pasadena, and Glendale are combined into one category by CEC.

27 California Energy Commission, Map of Electric Utility Service Areas in California. Retrieved October 29, 2007 from http://www.energy.ca.gov/maps/UTILITY_SERVICE_AREAS.PDF

28 Southern California Public Power Authority. 2005-2006 Annual Report. Retrieved October 29, 2007 from http://www.scppa.org/annualreport.htm

29 California Energy Commission. California Energy Demand 2006-2016, Staff Energy Demand Forecast, Staff Final Report. (September 2005). CEC-400-2005-034-SF-ED2.

30 U.S. Department of Energy, Alternative Fuels Data Center, Retrieved October 29, 2007 from http://www.eere.energy.gov/afdc/fuels/index.html

Ethanol is a clear, colorless liquid. Blends of at least 85 percent ethanol are considered alternative fuels under the EPAct. 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 EPAct regulations.

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 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 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 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 EPAct. Lower-level biodiesel blends are not considered alternative fuels, but covered fleets can earn one EPAct credit for every 450 gallons of B100 purchased for use in blends of 20 percent or higher.

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. 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.[31] **Map 3.5-2,** Electric Refueling Stations, identifies the location of planned, private and public refueling stations in the SCAG region.

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 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. 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.

On or before March 1 of each year, each retail provider who makes a claim of specific purchases during the previous calendar year provides a filing to the Energy Commission, providing certain information about each electricity product for which a claim is made.[32]

Cogeneration provides the most megawatts of energy from qualifying facilities for Southern California Edison with over 2,000 megawatts under contract. Wind is the second largest source for energy from qualifying facilities with over 1,000 megawatts. Southern California Edison’s energy from qualifying facilities and descriptions of each energy source are presented below.

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31 Southern California Edison, Electric Transportation website. Retrieved October 29, 2007 from http://www.sce.com/PowerandEnvironment/ElectricTransportationNew/Energy/

32 Public Utilities Code, Section 398.5 and California Code of Regulations, Section 1394

Cogeneration / Combined Heat and Power

Emissions stacks are synonymous with fossil fuel burning energy plants. Cogeneration captures a portion of the heat energy lost through the stacks to create power. Cogeneration means that the useful thermal energy produced as a by-product is captured at the same time electrical power is produced. This practice can increase the efficiency of energy production.

The most efficient and cost-effective form of distributed generation is cogeneration or combined heat and power. By recycling waste heat, these systems are much more efficient than systems that separately serve thermal and electric loads. They are also considerably more efficient than almost all conventional gas-fired power plants. California has more than 9,000 MW of combined heat and power systems throughout the state, representing approximately 17 percent of statewide generation.[33]

The petroleum refining industry is one of the largest users of cogeneration in the U.S. California refineries have an installed cogeneration capacity of about 1,400 MW and have the potential to increase their use of cogeneration technologies. Therefore, the California Energy Commission's 2005 Integrated Energy Report recommended that the state should work with the petroleum industry and other agencies to identify opportunities for additional cogeneration at refineries.[34]

There are several national and regional partnerships that promote cogeneration. The U.S. Environmental Protection Agency's (EPA) Combined Heat and Power (CHP) Partnership is "a voluntary program that seeks to reduce the environmental impact of power generation by fostering the use of cogeneration."[35] This partnership is designed to foster cost-effective cogeneration projects throughout the country.

Wind

Existing utility-scale wind power generation facilities in the SCAG region can be found in the San Gorgonio Pass near Palm Springs in Riverside County. This area currently has a generating capacity of 359 megawatts (MW). Utility-scale wind power is also generated in the Tehachapi Ranges in Kern County, with a capacity of 710 MW. Orange County has 36 MW of wind generation capacity. Other large resource areas in California include Altamont Pass (562 MW), Solano (165 MW), and Pacheco Pass (16 MW). Three of these primary regions (Altamont, Tehachapi and San Gorgonio) account for approximately 95 percent of all commercial wind power generation in California and approximately 11 percent of the world's wind-generated electricity. With an average California household using 6,500 kilowatt-hours (kWh) of electricity per year, 3.5 billion kWh of annual electricity generation from wind resources in the state provides electricity sufficient to power over 530,000 homes.[36]

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33 California Energy Commission, Integrated Energy Policy Report, (2005, November 21) page 3. Retrieved October 29, 2007 from http://www.energy.ca.gov/2005publications/CEC-100-2005-007/CEC-100-2005-007-CMF.PDF.

34 California Energy Commission, Integrated Energy Policy Report, (2005, November 21) page 42.

35 U.S. Environmental Protection Agency. (26 October 2006). Combined Heat and Power Partnership. Retrieved October 29, 2007, from http://www.epa.gov/CHP/index.html

36 California Energy Commission. (April 2005) California Wind Resources. Retrieved October 29, 2007 from http://www.energy.ca.gov/2005publications/CEC-500-2005-071/CEC-500-2005-071-D.PDF.

Geothermal

Southern California Edison has 955 megawatts of geothermal energy under contract. Geothermal energy comes from underground reservoirs of steam, hot water, and hot dry rocks. Hot water or steam extracted from geothermal reservoirs in the Earth's crust is supplied to steam turbines at electric utilities that drive generators to produce electricity.[37] The California Energy Commission's Geothermal Program was created by Assembly Bill 1905 (Bosco) and has been in operation since 1981.[38] The program promotes geothermal research and development of geothermal energy production in California.

Solar

California has set a goal to create 3,000 megawatts of new, solar-produced electricity by 2017. The California Public Utilities Commission, through its California Solar Initiative, provides incentives for existing residential homes and existing and new commercial, industrial, and agricultural properties. The California Energy Commission manages a 10-year, $400 million program to encourage solar in new home construction through its New Solar Homes Partnership.[39] As shown in **Table 3.5-1**, Southern California Edison has 879 megawatts of solar energy under contract, or approximately 3 percent of their power mix.

TABLE 3.5-1
SOUTHERN CALIFORNIA EDISON ENERGY FROM QUALIFYING FACILITIES

Technology	MegaWatts Under Contract
Cogeneration	2,087
Wind	1,220
Geothermal	955
Solar	879
Biomass	249
Small Hydro	94
Total	5,484

SOURCE: Southern California Edison Company. (31 January 2007). *QF Resources: Qualifying Facilities Semi-Annual Status Report to the California Public Utilities Commission.*

Solar thermal electricity is produced from the concentrating sunlight on a relatively small area to create the high temperatures needed to vaporize water or other fluids to drive a turbine for generation of electric power. In California's Mojave desert, there are huge rows of solar mirrors arranged in what's called "solar thermal power plants" that use this idea to make electricity for more than 350,000 homes.

37 U.S. Department of Energy. (August 2005). Geothermal Energy. Retrieved October 29, 2007 from http://www.eia.doe.gov/cneaf/solar.renewables/page/geothermal/geothermal.html.
38 California Energy Commission. (17 September 2007). Energy Commission Geothermal Program. Retrieved October 29, 2007, from http://www.energy.ca.gov/geothermal/.
39 The California Solar Initiative. Retrieved October 29, 2007 from http://www.gosolarcalifornia.ca.gov/csi/index.html

Solar cells (or photovoltaic energy) are small, square-shaped panel semiconductors made from silicon and other conductive materials. They are manufactured in thin film layers. When sunlight strikes a solar cell, chemical reactions release electrons, generating electric current. Solar cells are also called photovoltaic cells - or PV cells for short - and can be found on many small appliances, like calculators, toys and even hats. Individual PV cells are arranged together in a PV module and the modules are grouped together in an array. Some of the arrays are set on special tracking devices to follow sunlight all day long.

The electrical energy from solar cells can then be used directly. It can be used in a home for lights and appliances. It can be used in a business. Solar energy can be stored in batteries to light a roadside billboard at night. Or the energy can be stored in a battery for an emergency roadside cellular telephone when no telephone wires are around.

There are two primary PV markets. Off-grid systems are used where the cost of a PV system is cheaper than stringing electrical power lines long distances from the local utility. Grid-connected PV systems usually cannot compete directly with the cost of utility-produced power. Because of state incentives and federal tax credits, many people are considering grid-connected PV systems. If the PV system provides more power than the home or business uses, additional electricity is fed back into the grid for other people to use. This effectively spins an electricity meter backward in what is known as "net metering."

Incentives offered to homeowners and small businesses are helping develop a more robust PV industry in the United States. Additional, growing demand for PV cells, along with competition, can help drive down the per watt price of PV cells while, at the same time, create new jobs.

Photovoltaics or solar cells can be purchased in two formats: as a stand-alone module that is attached to your roof or on a separate system, or using integrated roofing materials with dual functions - that as a regular roofing shingle and as a solar cell making electricity.

Because they do not produce polluting air emissions or water effluents, solar PV systems are prime candidates for supplying electricity at locations where such environmental impacts are unacceptable (for example, in parks and places where preserving high levels of environmental quality is important).[40]

Biomass / Biofuels

As discussed under qualifying facilities, biofuels and biomass are alternative energy sources that can be developed to reduce the dependence on energy from fossil fuels. The U.S. Department of Energy's Biomass Program promotes biomass and biofuels because biomass use "strengthens rural economies, decreases America's dependence on imported oil, avoids use of MTBE or other highly toxic fuel additives, reduces air and water pollution, and reduces greenhouse gas

[40] California Solar Initiative, Solar 101. Retrieved October 29, 2007 from http://www.gosolarcalifornia.ca.gov/solar101/what_is.html

emissions."[41] Nationwide in 2003, biomass was the leading source of renewable energy, accounting for 47 percent of the renewable energy produced in the United States and 4 percent of the total energy produced within the U.S.[42] There are 26 biomass-to-energy plants operating in California, with a total generating capacity of 550 MW.[43] Southern California Edison has 254 MW of biomass under contract within the SCAG region.

Small Hydroelectric

Small hydroelectric facilities provide 94 megawatts of energy to Southern California Edison under their qualifying facilities contract. Large hydroelectric facilities provide a major source of power in California. These large facilities are operated by the federal government's Bureau of Reclamation and the state government's Department of Water Resources and are located on dams in the state.[44] Power utilities such as Southern California Edison operate the smaller hydroelectric facilities in the state. Hydroelectric projects larger than 30 MW are not considered eligible under the Renewable Portfolio Standard program for Investor Owned Utilities (IOUs). However, most Publicly Owned Utilities (POUs) still count generation from these projects toward their renewable energy targets.[45]

Conversion Technologies

Conversion technologies (CTs) refer to a diverse set of processes used to convert post-recycled, municipal solid waste to intermediate liquid, gas, or solid fuel products. The fuel products can then be combusted to produce energy. Conversion technology processes include (but are not limited to) the following:

- Gasification – the thermal conversion of solid organic material that takes place at elevated temperatures and pressures in the presence of oxygen to yield a gaseous product or solid char.
- Pyrolysis – similar to gasification but occurs in the absence of air and optimized for the production of fuel liquids.
- Catalytic Cracking – uses catalysts to accelerate the breakdown of polymers – such as plastics – into its basic unit which can be further processed to produce fuels (low-sulfur diesel and gasoline).
- Acid Hydrolysis – biomass is treated with an acid to break the plant matter down into its component sugars for subsequent fermentation to ethanol.
- Anaerobic Digestion – a bacterial fermentation process that produces a gas (biogas) from organic waste such as livestock manure, food waste, wastewater sludge, etc.

41 U.S. Department of Energy. (7 June 2007). Biomass Program. Accessed October 29, 2007, from http://www.eere.energy.gov/biomass/.
42 U.S. Department of Energy. (15 March 2007). Biomass Today. Accessed October 30, 2007, from http://www1.eere.energy.gov/biomass/biomass_today.html.
43 California Integrated Waste Management Board. (17 October 2007). Biomass to Energy. Accessed October 30, 2007 from http://www.ciwmb.ca.gov/Organics/Conversion/BioEnergy/.
44 California Energy Commission. (22 May 2001). Hydroelectric Power in California. Accessed October 30, 2007, from http://www.energy.ca.gov/electricity/hydro.html.
45 California Energy Commission (21 November 2005). 2005 Integrated Energy Policy Report. Adopted November 21, 2005.

CT systems often utilize a combination of two or more processes. Direct combustion (incineration) does not fall under the conversion technology category.[46]

The public health impacts of conversion technologies are still being assessed, but CTs with appropriate controls and emissions technology produce lower emissions of criteria air pollutants (NOx and SOx) than either landfills or direct combustion incinerators. The environmental benefits of CT scenarios are dependent on their ability to achieve high conversion efficiencies and high materials recycling rates.

Distributed Generation

An important alternative to new central station fossil-fueled generation is distributed generation (DG), which includes both cogeneration and self-generation. DG is broadly defined as electricity produced on-site or close to a load center that is also interconnected with a utility distribution system. California has approximately 2,500 MW of small scale renewable and non-renewable DG and has added an average of 100 MW of new small scale DG capacity every year since 2001.[47]

A small portion of the SCAG region's electrical power is currently provided by distributed energy resources. The LADWP Draft 2006 Power System Integrated Resource Plan has a goal to increase the commitment and funding to customer energy efficiency, demand side management and distributed generation programs and to aggressively pursue the goal of achieving 20 percent renewable energy by the year 2010. This policy, known as the Renewable Portfolio Standard (RPS), calls for diversifying renewables by location and technology, and pursuing both owned renewable power projects and purchase power agreements.[48] SCE also has a program to encourage distributed generation and meet the RPS.[49]

The limited use of distributed generation in the SCAG region reflects a number of barriers that have slowed adoption. According to the National Renewable Energy Laboratory, barriers include the following:

- Relatively small projects may face high fees, long approval processes, or burdensome insurance requirements. An example is high backup or standby charges, which a utility collects to cover the cost of providing power when the DG system is not operating. Another is an exit fee, which is levied on customers leaving the grid to compensate the utilities for the stranded cost of generating facilities.
- There is no national consensus on standard interconnection practices, so each project must go through a unique process, pay different charges, and meet different technical and safety standards. This may partly reflect utilities' lack of experience with DG

46 California Integrated Waste Management Board website. Retrieved October 23, 2007 from http://ciwmb.ca.gov/Organics/Conversion/
47 California Energy Commission (21 November 2005). 2005 Integrated Energy Policy Report. Adopted November 21, 2005.
48 Los Angeles Department of Water and Power. (2 May 2006) Draft Integrated Resource Plan. Retrieved October 29, 2007 from http://www.ladwp.com/ladwp/cms/ladwp008065.pdf
49 Southern California Edison, Self Generation website. Retrieved October 29, 2007 from http://www.sce.com/RebatesandSavings/GeneratingYourOwnPower.

projects, but could also stem from an understandable reluctance to lose part of their customer base.

- Local codes, standards, and environmental regulations that are not structured to recognize the attributes of distributed power.[50]

Nuclear Energy

California receives approximately 15 percent of its energy from nuclear sources. The three plants that supply this energy include the Diablo Canyon Power Plan located near San Luis Obispo, the San Onofre Nuclear Generating Station located near San Clemente, and the Palo Verde Nuclear Generation Station located near Phoenix, Arizona. The San Onofre Nuclear Generating station provides power to the Southern California Edison service area and has a capacity of 2,254 megawatts.[51] The San Onofre Nuclear Generating Station (SONGS) is jointly owned by Southern California Edison (SCE) (75 percent ownership), San Diego Gas & Electric (20 percent), and the cities of Riverside and Anaheim. Today, SONGS provides nearly 20 percent of the power to more than 15 million people in Southern California -- enough power to serve 2.75 million households.[52]

The increasing demand for energy and concerns about global warming has resulted in increased interest in nuclear energy. Many U.S. nuclear power plant operators are seeking approval from the U.S. Nuclear Regulatory Commission for license renewals. These extensions could keep the aging fleet of U.S. nuclear power plants operating for an additional 20 years, with uncertain economic, environmental, and reliability implications. In light of California's moratorium on nuclear power development, until progress is made in disposing of or reprocessing spent fuel, the Energy Commission could not provide land use permits or certification for such a power plant at this time. It is unlikely that the Energy Commission will be able to provide land use permits or certification for a new nuclear power plant in California in the near future.[53]

Consumptive Uses

Travel Fuel Consumption

The California Department of Transportation (Caltrans) forecasts the annual statewide and countywide number of vehicles, vehicle miles of travel (VMT), vehicle fuel consumption (VFC), and vehicle fuel economy (VFE).[54] Caltrans reports that vehicles in the SCAG region consumed over 23 million gallons of fuel per day in 2005 (the most recent data available). The 422 million

50 U.S. Dept. of Energy, Energy Efficiency and Renewable Energy. Retrieved October 29, 2007http://www.eere.energy.gov/de/overcoming_obstacles.html,.

51 California Energy Commission. Nuclear Power in California: 2007 Status Report. (June 2007). Retrieved from http://energy.ca.gov/2007publications/CEC-100-2007-005/CEC-100-2007-005-D.PDF on July 27, 2007.

52 Southern California Edison, San Onofre Nuclear Generating Station. Retrieved from http://www.sce.com/PowerandEnvironment/PowerGeneration/SanOnofreNuclearGeneratingStation/ on July 30, 2007.

53 California Energy Commission. Nuclear Power in California: 2007 Status Report. (June 2007). Retrieved from http://energy.ca.gov/2007publications/CEC-100-2007-005/CEC-100-2007-005-D.PDF on December 11, 2007.

54 Caltrans' Motor Vehicle Stock, Travel and Fuel Forecast Motor provides forecasts of Vehicle Miles Traveled (VMT), Vehicle Fuel Consumption (VFC), registered vehicles, and vehicle fuel economy on a statewide basis. The forecasts are disaggregated by county, road system, vehicle body type, and vehicle fuel type. The travel fuel consumption data from Caltrans provides the 2005 on-road fuel consumption estimate from the Board of Equalization's sales data.

vehicle miles traveled daily in the SCAG region in 2005 represented 47 percent of all vehicle miles traveled in the state.

California currently imports 61 percent of its petroleum from out-of-state sources, including 45 percent from foreign sources.[55] However, California's refining capacity has not been able to keep up with the demand for transportation fuels.[56] Because of that, the gasoline market is increasingly unstable as refinery accidents or scheduled maintenance create shortages and price fluctuations.[57]

The California Energy Commission has studied clean fuels infrastructure on a state level, and provides some insight into the SCAG region's infrastructure levels. For example, the CEC's 2003 market assessment of clean fuels infrastructure reveals that the Los Angeles Metropolitan Transit Authority (Metro) has the largest fleet of natural gas buses in California—over 2,000 in operation or on order at that time—and the Orange County Transportation Authority operated 232 liquid natural gas buses at that time. These numbers suggest that the region leads the State in alternate fuel vehicle use by public agencies.[58]

Transportation

Transportation, i.e., the movement of people and goods from place to place, is an important end use of energy in California, accounting for approximately 40 percent of total statewide energy consumption in 2004 and 12 percent of total U.S. transportation energy consumption.[59] **Table 3.5-2** shows annual transportation consumption in the SCAG region. Nonrenewable energy products derived from crude oil; including gasoline, diesel, kerosene, and residual fuel, provide most of the energy consumed for transportation purposes by on-road motor vehicles (i.e., automobiles and trucks), locomotives, aircraft, and ships. In addition, energy is consumed in connection with construction and maintenance of transportation infrastructure, such as highways, locomotives, runways, and berths. Trends in transportation-related technology foretell increased use of electricity and natural gas for transportation purposes.

Transportation energy is derived from a wide variety of petroleum products. Automobiles and trucks consume gasoline and diesel fuel. Turbine aircraft consume kerosene fuel; locomotives consume diesel fuel; and ships consume residual fuel oil. The transportation sector consumes relatively minor amounts of natural gas or electricity, but, propelled mainly by air quality laws and

55 California Energy Commission, Oil Supply Sources to California Refineries. Retrieved October 29, 2007 from http://www.energy.ca.gov/oil/statistics/crude_oil_receipts.html
56 California Energy Commission/California Air Resources Board: Reducing California's Petroleum Dependence, August 14, 2003 Final, Adopted Joint Agency AB 2076 Report, publication # 600-03-006F.
57 California Energy Commission (CEC)/California Air Resources Board: Reducing California's Petroleum Dependence, August 14, 2003 Final, Adopted Joint Agency AB 2076 Report, publication # 600-03-006F.
58 Burr Consulting, Regional Infrastructure Evaluation: A Report to the Southern California Association of Governments, September 18, 2006. Page 90.
59 Energy Information Administration, State Energy Profiles, California. (October 2007). Retrieved October 29, 2007 from http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=CA

TABLE 3.5-2
ANNUAL TRANSPORTATION ENERGY CONSUMPTION IN THE SCAG REGION

Category	Fuel Type	Year	Consumption	Units
Motor Vehicles	Gasoline/Diesel (1)	2005	8,524,639	(SCAG) thousand gallons
	Natural Gas (Compressed and Liquefied) (2)	2004	22,630	(CA) million cubic feet
	Hydrogen (3)	2006	0.02	(CA) million kilograms
	Ethanol (4)	2006	23	(CA) million barrels
Aircraft	Aviation Gasoline, Kerosene-type jet fuel (5)	2006	14,599,670	(SCAG) thousand gallons
Locomotives	Distillate Fuel Oil (6)	2005	324,496	(CA) thousand gallons
Ships (Vessel Bunkering)	Residual and Distillate Fuel Oil (7)	2005	677,949	(CA) thousand gallons

NOTE: California's transportation sector is more than 95 percent dependent on petroleum. Therefore, additional alternative fuels are not shown in this table.

(1) Source: California Department of Transportation, Division of Transportation System Information. (December 2006). California Motor Vehicle Stock, Travel and Fuel Forecast.
(2) Source :California Energy Commission, Natural Gas Statistics. Retrieved September 27, 2007 from http://www.energy.ca.gov/naturalgas/natural_gas_facts.html. and United States Department of Energy Alternative Fuels and Advanced Vehicles Data Center, Energy Efficiency and Renewable Energy, Estimated Consumption of Alternative Fuel by AFVs (in thousand GGEs), http://www.eere.energy.gov/afdc/data/docs/alternative_fuel_consumption.xls
(3) Source: South Coast Air Quality Management District, 2007 Final Program Environmental Impact Report for the Air Quality Management Plan, Energy Chapter, Retrieved October 5, 2007 from http://www.aqmd.gov/ceqa/documents/2007/aqmd/finalEA/07aqmp/ch4.2_FPEIR.pdf
(4) California Energy Commission, 2007 Integrated Energy Policy Report Staff Draft. (October 2007). Retrieved on October 5, 2007 from http://energy.ca.gov/2007publications/CEC-100-2007-008/CEC-100-2007-008-CTD.PDF
(5) United States Department of Energy, Table 5.13c Estimated Petroleum Consumption: Transportation Sector, 1949-2006. Retrieved October 5, 2007 from http://www.eia.doe.gov/emeu/aer/txt/ptb0513c.html; Source" Federal Aviation Administration, Passenger Boarding and All Cargo Data for U.S. Airports 2006. Retrieved November 2, 2007 from http://www.faa.gov/airports_airtraffic/airports/planning_capacity/passenger_allcargo_stats/passenger/index.cfm?year=2006
(6) United States Department of Energy, Energy Information Administration. Table 13: Adjusted sales of distillate fuel oil by energy use in the United States: 2001-2005. Retrieved September 27, 2007, from 2005
(7) United States Department of Energy, Energy Information Administration. Table 13: Adjusted sales of distillate fuel oil by energy use in the United States: 2001-2005. Retrieved September 27, 2007, from http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/fuel_oil_and_kerosene_sales/current/pdf/table23.pdf

regulations, technological innovations in transportation are expected to increasingly rely on compressed natural gas and electricity as energy sources. Biodiesel, derived from plant sources such as used vegetable oils, is a small but growing source of transportation fuel. Vehicles powered by fuels other than gasoline or diesel are referred to as "alternative fuel vehicles."

Roadways

Energy consumption by on-road motor vehicles reflects the types and numbers of vehicles, the extent of their use (typically described in terms of VMT), and their fuel economy (typically described in terms of miles per gallon). Trends in energy consumption by on-road motor vehicles generally follow trends in population and per capita income as well as trends in land use development patterns. For example, diffuse land use development patterns can result in an

imbalance between jobs and housing, which can lead to longer average commute trips. For example, a smart growth development plan that increases density by 30 percent, emphasizes infill and mixes land use to a high degree would be expected to reduce regional VMT by about 15 percent per capita over 30 years.[60]

Airports

As shown in **Table 3.5-2**, jet fuels consumption in California represents approximately 14,599,670 thousand gallons in 2006. The SCAG region has 57 public use airports, including six established commercial service airports, 45 general aviation, two recently closed military air bases (one certified as a commercial service airport), two commuter airports, and two joint-use facilities. Six established commercial service airports handle the majority of passenger air traffic: Bob Hope, John Wayne/Orange County, Long Beach, Los Angeles International, Ontario International and Palm Springs. Limited commercial service exists at Oxnard and Imperial County airports. In 2006, passenger activity at these airports was approximately 43 million boardings.[61] Airports also play an important role in goods movement, as air cargo is transported in either passenger aircraft belly-holds or in dedicated freight aircraft used primarily for high value, time sensitive shipments. In 2006, 5 million tons of air cargo were handled by the region's airports.[62] The most recent data available for the SCAG region's consumption of aviation fuel was derived from the United States Department of Energy's estimated petroleum consumption for the transportation sector and the percentage of boardings at airports in the SCAG region.

Ports

Table 3.5-2 also includes energy consumption estimates for locomotives and ships. Locomotive consumption of diesel fuel in California was 324,496 thousand gallons in 2005, the most recent year available. Vessel bunkering fuel use was approximately 678,000 thousand gallons in 2005. Residual fuel and distillate fuel oil consumption by ships in the SCAG region was estimated by applying the ratio of waterborne traffic (in millions of short tons) associated with Long Beach and Los Angeles Ports over total national waterborne traffic to nation-wide estimates of residual fuel consumption for vessel bunkering.[63] The Port of Los Angeles employs an Alternative Maritime Power (AMP) program that allows ships to plug in to shore side electrical power and the Port of Long Beach initiated a voluntary project to install shore-side electrical power, which could provide reductions the estimated vessel bunkering fuel use.

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60 California Energy Commission. (August 2007). The Role of Land Use in Meeting California's Energy and Climate Change Goals. Final Staff Report. CEC-600-2007-008-SF.

61 Federal Aviation Administration.CY 2006 Passenger Boarding and All-Cargo Data. (October 18, 2007). Retrieved October 29, 2007 from http://www.faa.gov/airports_airtraffic/airports/planning_capacity/passenger_allcargo_stats/passenger/index.cfm?year=2006

62 Federal Aviation Administration, All Cargo Data. Qualifying Cargo Airports, Rank Order, and Percent Change from 2006. Retrieved October 29, 2007 from http://www.faa.gov/airports_airtraffic/airports/planning_capacity/passenger_allcargo_stats/passenger/media/cy06_cargo.pdf

63 Southern California Association of Governments (September 2005). Goods Movement in Southern California: The Challenge, The Opportunity, and The Solution. Retrieved October 5, 2007 from http://scag.ca.gov/goodsmove/pdf/GoodsmovePaper0905.pdf

Electricity

Electricity is produced in several different ways. Natural gas is used to supply the largest percentage of electricity in California. Combined with natural gas, the energy sources of coal, large hydrologic systems, and nuclear power provide approximately 90 percent of the energy to make electricity in the state. Only 10 percent of electricity in the state comes from renewable energy sources such as geothermal, biomass, small hydrologic projects, wind, and solar sources. Power generation by type can be seen in **Table 3.5-3**, below:

TABLE 3.5-3
CALIFORNIA GROSS SYSTEM POWER GENERATION FOR 2006 (GIGAWATT-HOURS)

Fuel Type	In-State	Northwest Imports	Southwest Imports	Gross System Power (GSP)	GSP Percentage
Coal {1}	17,573	5,467	23,195	46,235	15.7%
Large Hydro	43,088	10,608	2,343	56,039	19.0%
Natural Gas	106,968	2,051	13,207	122,226	41.5%
Nuclear	31,959	556	5,635	38,150	12.9%
Renewables	30,514	1,122	579	32,215	10.9%
Biomass	5,735	430	120	6,285	2.1%
Geothermal	13,448	0	260	13,708	4.7%
Small Hydro	5,788	448	0	6,236	2.1%
Solar {2}	616	0	0	616	0.2%
Wind	4,927	244	199	5,370	1.8%
TOTAL	**230,102**	**19,804**	**44,959**	**294,865**	**100.0%**

Notes:

{1} The in-state coal-fired generation includes electricity generated from several out-of-state coal-fired power plants that are owned by and reported by California utilities. There are other out-of-state generation facilities that are owned by California utilities, which are reported as imports.

{2} This number only includes generator-reported electricity, not electricity produced by many small-scale photovoltaic installations throughout the state. Based on the the Energy Commission's Renewable Energy Program records, the state has financed approximately 135,517 kilowatts (kW) of solar photovoltaic capacity. Assuming that each installed kW of PV-generated 1,500 kWh in 2005, then the combined output of these PV systems would add another 203.3 gigawatt-hours to the gross system power totals.

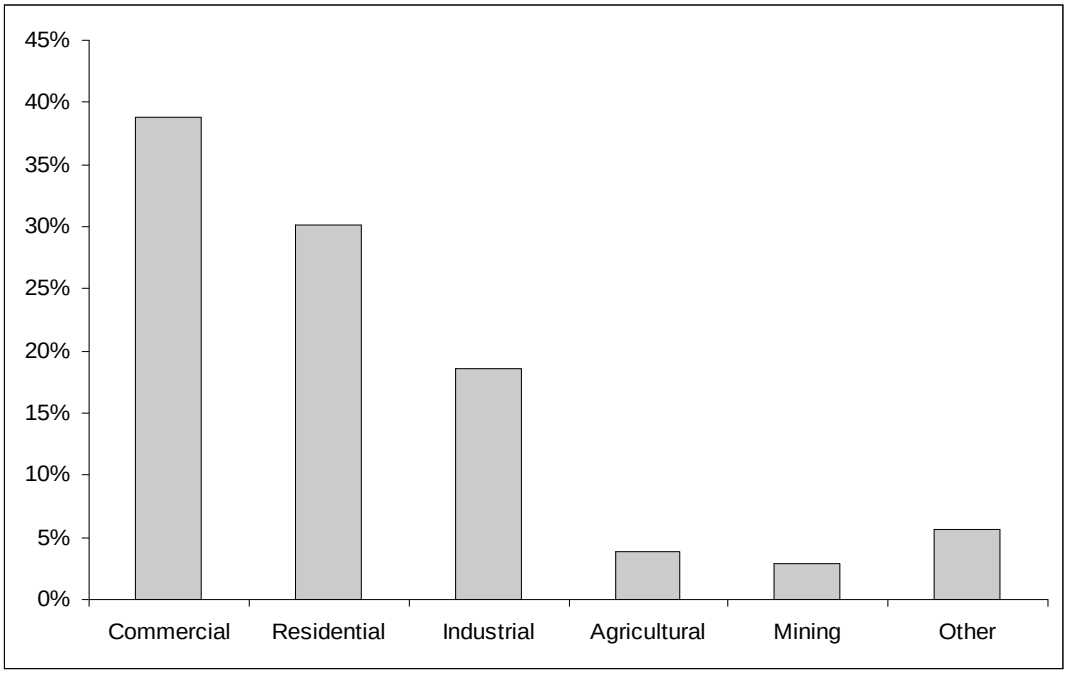
SOURCE: California Energy Commission. 2006 Net System Power Report, Energy Commission Publication # CEC-300-2007-007. Accessed October 5, 2007, from http://www.energy.ca.gov/electricity/gross_system_power.html

Different sectors of the economy use different amounts of electricity. Based on 2004 demand, the commercial sector uses the most electricity in California (37 percent), followed by the residential (31 percent) and then the industrial sector (16 percent). Agricultural, mining, and other users account for 16 percent of the electricity consumed in the state.[64]

64 California Energy Commission. (September 2005). California Energy Demand 2006-2016 Staff Energy Demand Forecast. Retrieved October 22, 2007 from http://www.energy.ca.gov/2005publications/CEC-400-2005-034/CEC-400-2005-034-SF-ED2.PDF

The SCAG region consumed approximately 46 percent of the electricity in the state in 2004. The percentage of consumption by individual sectors follows the same pattern as the state. Commercial, residential, and industrial users consume 88 percent of the electricity in the region, with the remaining 14 percent consumed by agricultural, mining, or other uses.[65] **Figure 3.5-3** shows the distribution of electricity consumption, by sector, for the SCAG region in 2004, which is the most recent data year available. The California Energy Commission's Demand Forecast indicates that the SCE planning area data includes the following utilities: Anaheim, Anza, Azusa, Banning, Colton, Metropolitan Water District, Riverside, SCE, Southern California Water, USBR-Parker Davis, Valley Electric, and Vernon.[66]

FIGURE 3.5-3
SCAG REGION PERCENTAGE OF ELECTRICITY CONSUMPTION BY SECTOR



SOURCE: California Energy Commission, California Energy Demand 2006-2016, Staff Energy Demand Forecast, Revised September 2005, Staff Final Report, CEC-400-2005-034-SF-ED2.

Natural Gas

Californians consumed approximately 6 billion cubic feet per day of natural gas in 2004.[67] The Energy Commission expects residential natural gas use to increase by 1.3 percent per year and commercial natural gas use to increase by 1.8 percent per year. Industrial natural gas demand,

65 California Energy Commission. (September 2005). California Energy Demand 2006-2016 Staff Energy Demand Forecast. Retrieved October 22, 2007 from http://www.energy.ca.gov/2005publications/CEC-400-2005-034/CEC-400-2005-034-SF-ED2.PDF

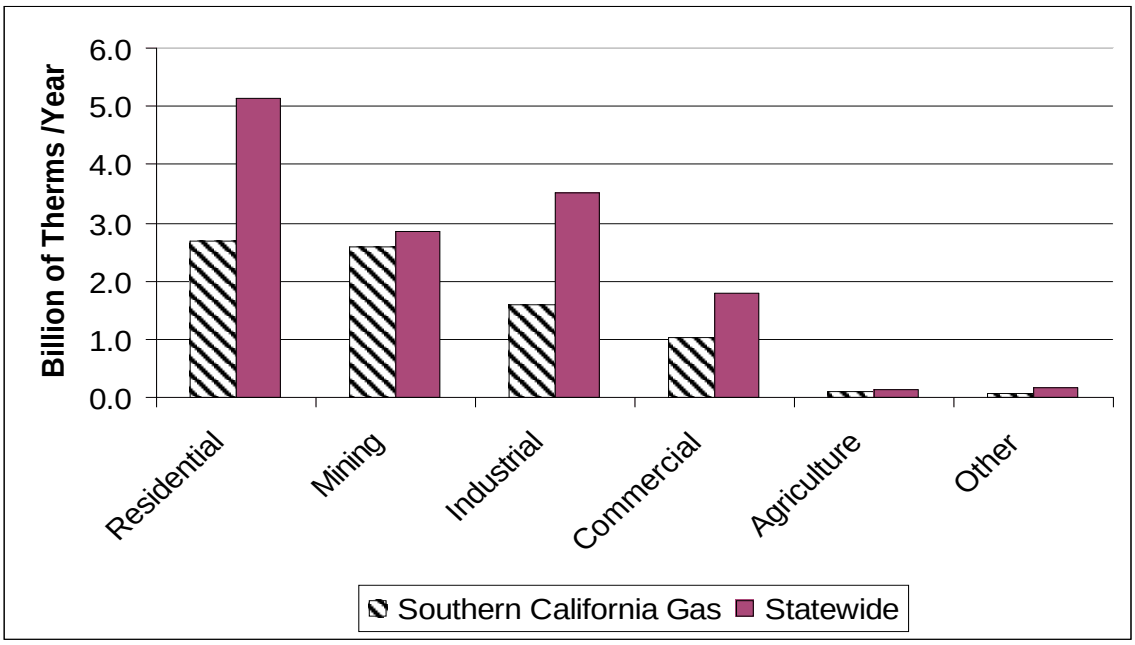
66 California Energy Commission. (September 2005). California Energy Demand 2006-2016 Staff Energy Demand Forecast. Retrieved October 22, 2007 from http://www.energy.ca.gov/2005publications/CEC-400-2005-034/CEC-400-2005-034-SF-ED2.PDF, page 1-5

67 California Energy Commission, Natural Gas Facts. Retrieved October 23, 2007 from http://www.energy.ca.gov/naturalgas/natural_gas_facts.html.

however, is expected to be flat or decline in nearly all of the western states because industrial customers are the most likely to respond to currently rising natural gas prices. [68]

The most recent data from the California Energy Commission show that the residential sector uses the largest amount of natural gas, both across the state and in the SCAG region as shown in **Figure 3.5-4**. In 2004, the mining sector was second in the amount of natural gas consumed in the SCAG region. Statewide, the industrial sector was second in the amount of natural gas consumed. The commercial sector falls behind residential, mining, and industrial uses in natural gas consumption in the SCAG region and statewide. The agricultural sector accounts for only 1 percent of the natural gas use statewide and in the SCAG region.[69]

FIGURE 3.5-4
NATURAL GAS DEMAND BY SECTOR SOUTHERN CALIFORNIA GAS VS. STATEWIDE



SOURCE: California Energy Commission, (Revised September 2005) California Energy Demand 2006-2016 Staff Energy Demand Forecast 2005, CEC-400-2005-034-SF-ED2.

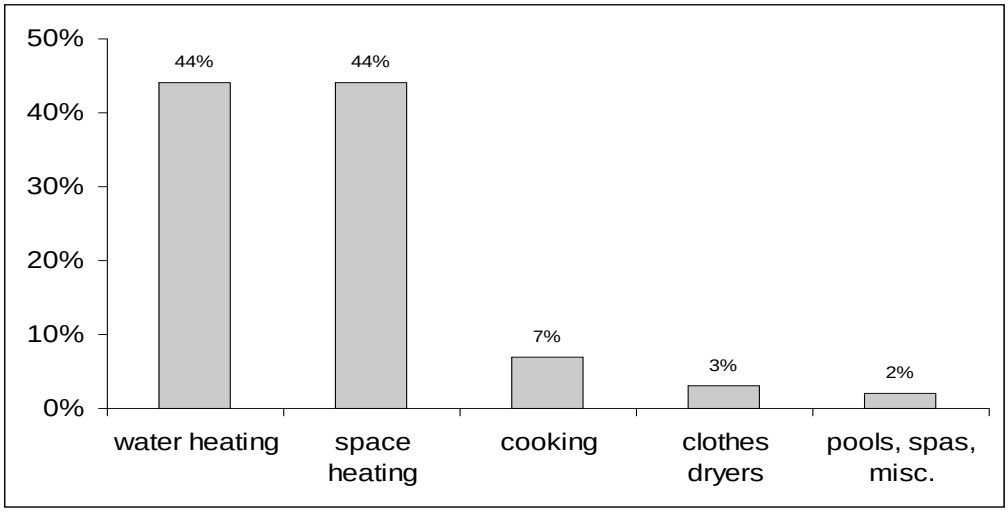
Figure 3.5-5 illustrates the residential uses of natural gas in California. The two residential uses that consume the largest percentage of natural gas are space heat and hot water. Natural gas is also used to heat the water for washing machines, dishwashers, and swimming pools. Natural gas used for cooking purposes ranks fourth in terms of residential uses for natural gas.[70]

68 California Energy Commission, 2005 Integrated Energy Policy Report (2005, November), page 125. Retrieved October 23, 2007 from http://www.energy.ca.gov/2005publications/CEC-100-2005-007/CEC-100-2005-007-CMF.PDF

69 California Energy Commission, California Energy Demand 2006-2016 Staff Energy Demand Forecast, Revised September 2005, CEC-400-2005-034-SF-ED2. Retrieved October 23, 2007 from http://www.energy.ca.gov/2005publications/CEC-400-2005-034/CEC-400-2005-034-SF-ED2.PDF

70 California Energy Commission. (Adopted November 21, 2005) 2005 Integrated Energy Policy Report, page 127. Retrieved October 23, 2007 from http://www.energy.ca.gov/2005publications/CEC-100-2005-007/CEC-100-2005-007-CTF.PDF

FIGURE 3.5-5
RESIDENTIAL NATURAL GAS USE IN CALIFORNIA



Source: California Energy Commission. (Adopted November 21, 2005) 2005 Integrated Energy Policy Report.

Major energy consumption sectors (i.e., in addition to transportation) include residential, commercial, industrial uses as well as street lighting, mining, and agriculture. Unlike transportation, these sectors primarily consume electricity and natural gas. Total annual electricity consumption in the SCAG region is approximately 123,678 million kWh (39,432 kWh for residential uses and 84,246 kWh for nonresidential uses). The residential, commercial, and industrial sectors account for approximately 30, 39, and 19 percent, respectively, of total regional electricity consumption. The agricultural sector accounts for another 4 percent.[71]

Electricity use by households varies depending on the local climate and on the housing type (i.e., single-family vs. multi-family). **Table 3.5-4** summarizes residential and nonresidential electricity use by county in the SCAG region.

TABLE 3.5-4
AVERAGE ANNUAL ELECTRICITY USAGE BY COUNTY

County	Residential kWh (billions)	Nonresidential kWh (billions)
Imperial	0.61	1.00
Los Angeles	20.34	50.42
Orange	6.90	14.21
Riverside	6.04	8.03
San Bernardino	5.54	10.42
Ventura	1.85	3.98
SCAG TOTAL	41.27	88.06
California	86.35	186.11

SOURCES: California Energy Commission, California Electricity Consumption by County in 2005. Retrieved October 23, 2007 from http://www.energy.ca.gov/electricity/electricity_by_county_2005.html and Terry Hayes and Associates

71 California Energy Commission, California Energy Demand 2006-2016, Staff Energy Demand Forecast, Revised September 2005, Staff Final Report, CEC-400-2005-034-SF-ED2

Total annual natural gas (end use) consumption in the SCAG region is approximately 2,197 million cubic feet. The residential, commercial, and industrial sectors account for approximately 31, 13, and 19 percent, respectively, of total regional natural gas (end use) consumption. Electrical generation accounts for 35 percent of regional natural gas consumption.[72]

Consumption Reduction Efforts

There are various policies and initiatives to reduce non-petroleum vehicle fuel consumption and increase the share of renewable energy generation and use in the region. These strategies include energy efficient building practices, smarter land use with access to public transportation, increasing automobile fuel efficiency, and participating in energy efficiency incentive program. All publicly owned utilities and most municipal owned utilities that provide electric and natural gas service also administer energy conservation programs. These programs typically include home energy audits; incentives for replacement of existing appliances with new, energy-efficient models; provision of resources to inform businesses on development and operation of energy-efficient buildings; and construction of infrastructure to accommodate increased use of motor vehicles powered by natural gas or electricity.

Cities in the SCAG region are voluntarily taking steps to reduce their energy consumption. For example, Azusa Light & Water has ensured that energy efficiency is part of integrated resource planning by determining and implementing the most cost-effective, reliable, and feasible energy efficiency measures. They have expended over $4,250,000 toward providing energy conservation information to the Azusa community and rewarding the businesses and residents for upgrading inefficient energy consuming equipment with more energy efficient equipment. Azusa Light & Water is continuing to explore addition supplies of renewable energy to meet the year 2010 requirements of 20 percent renewable energy in the power portfolio.[73]

In June 2006, the City of Ventura installed a 110-kilowatt solar electric system at its maintenance yard. Each year the system produces about 180,000 kWh of electricity (45 percent of the facility's needs) and saves the City around $25,000. Nearly 75 percent of the project costs were funded through a renewable energy rebate from California Edison and from a low-interest loan from the California Energy Commission. In addition, over the past year the City has replaced over 2,700 lights at 5 major facilities with the latest energy efficient lights. The City also installed energy efficient motors and pumps on the HVAC systems at City Hall and Police Fire Headquarters. These efforts will reduce electricity use by an estimated 1.9 million kWh and save over $100,000 each year. No general fund money was used to fund these projects. The Ventura County Regional Energy Alliance provided about 40 percent of the project costs, while the remainder was financed through the California Energy Commission's low-interest loan program. The loan is repaid using money saved from reduced electricity costs.[74]

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72 California Gas Utilities, California Gas Report 2007 Supplement. Retrieved October 23, 2007, from Southern California Gas Company Web site: http://www.socalgas.com/regulatory/docs/2007_CGR.pdf
73 Personal communication, Joe Hsu, Azusa Light & Water, November 28, 2006.
74 Personal communication, Carl Morehouse, Mayor, City of San Buenaventura, November 16, 2006.

Regulatory Setting

Federal Regulations

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 on November 27, 2007, included an RFS of 4.66 percent for 2008.

State Regulations

The California Energy Commission and California Public Utilities Commission have jurisdiction over the 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

As mentioned above, California established statewide building energy efficiency standards following legislative action. The legislation required the standards to:

- be cost-effective,
- be based on the building life cycle, and to
- include both prescriptive and performance-based approaches.[75]

California's building efficiency standards (along with those for 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.[76]

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 2008 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

75 California Energy Commission. Initial Study/Proposed Negative Declaration for the 2005 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, Staff Report, September 2003, P400-03-018, p. 7.

76 California Energy Commission. Title 24, Part 6 website, Retrieved October 30, 2007 from http://www.energy.ca.gov/title24/.

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.

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.[77]

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.

[77] California Energy Commission, 2005 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, P400-03-001F, Effective Date October 1, 2005, Section 100(f).

- 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.
- Adopt a plan by January 1, 2009 indicating how emission reductions will be achieved from significant GHG sources.
- 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 10 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 (SB1), 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 SB1, 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.[78]

[78] California Solar Initiative. Retrieved October 31, 2007 from http://www.gosolarcalifornia.ca.gov/csi/index.html

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:[79]

- Near-Term Options (could be fully implemented by 2010)
    - Use more fuel efficient replacement tires with proper inflation
    - Improve fuel economy in government fleets
    - 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
    - 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.

Recommendations include:[80]

- 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.
- 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 must prepare these guidelines and transmit them to the Resources Agency by July 1, 2009. The Resources Agency must 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.

79 CEC/California Air Resources Board: Reducing California's Petroleum Dependence, August 14, 2003 Final, Adopted Joint Agency AB 2076 Report, publication # 600-03-006F.

80 CEC/California Air Resources Board: Reducing California's Petroleum Dependence, August 14, 2003 Final, Adopted Joint Agency AB 2076 Report, publication # 600-03-006F.

Clean Cities Program

The U.S. Department of Energy's 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.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the proposed 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) because population and employment are projected to be higher in this year than in any earlier year. 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 travel fuel consumption was estimated for 2035 using SCAG's regional transportation demand model and the EMFAC/BURDEN air quality model, which provides estimated gasoline and diesel fuel consumption for the 2008 RTP. 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).[81] Existing dwelling units and employees in each county were used to obtain an electricity usage rate per dwelling unit and employee.[82] Then, the electricity usage rate was multiplied by the

[81] California Energy Commission, California Electricity Consumption by County in 2005. Retrieved October 23, 2007 from http://www.energy.ca.gov/electricity/electricity_by_county_2005.html

[82] According to the latest CEC Energy Demand Forecast (2008-2018), the statewide electricity demand per capita is expected to remain constant between 2008 and 2018. Therefore, the electricity use rate was assumed to be constant for each of the analyzed years.

correlating dwelling units and employees for each of the analyzed alternatives to obtain the total electricity consumption in kilowatt-hours for each county.

Natural gas consumption was obtained from the CEC, which provides data by utility planning area and not by county.[83] Therefore, a natural gas use rate applicable to the entire SCAG region was developed to forecast future natural gas consumption. Existing dwelling units and employees in each county were used to obtain a natural gas usage rate per dwelling unit and employee.[84] The natural gas use rate was multiplied by the correlating numbers for each of the analyzed alternatives to obtain the total natural gas use in standard cubic feet per year each county.

Comparison with the No Project

The analysis of energy resources 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 to existing conditions); however, it provides a meaningful perspective on the expected effects of the 2008 RTP.

Determination of Significance

The methodology for determining the significance of energy impacts compares existing conditions to the expected future energy consumption with the Plan, as required in *CEQA Guidelines §* 15126.2(a). Criteria below were applied to compare current energy usage to expected future (2035) Plan conditions.

Significance Criteria

A *significant impact* is defined as "a substantial or potentially substantial, adverse change in the environment" (CEQA §21068). The proposed Plan would have a significant impact if implementation would potentially:

- 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;

83 California Energy Commission, (September 2005) California Energy Demand 2006-2016 Staff Energy Demand Forecast 2005, CEC-400-2005-034-SF-ED2.

84 According to the latest CEC Energy Demand Forecast (2008-2018), the statewide per capita consumption shows a steady decline between 2008 and 2018. The forecast for the 2008 RTP PEIR assumed a constant the natural gas use rate for each of the analyzed years, which results in a conservative estimate of future use.

- Be inconsistent with adopted plans or policies, including greenhouse gas reduction levels identified in AB 32 (1990 levels by 2020)[85]; or
- Cause a cumulatively considerable increase in energy consumption and associated environmental effects.

Impacts and Mitigation Measures

Implementation of the 2008 RTP would affect the use of energy resources in the SCAG region. The analysis of these impacts is at the regional level and is therefore by its nature an analysis of cumulative impacts. Three main areas of impact have been identified: energy demands for construction and expansion of the regional transportation system; energy demands for operation of the regional transportation system as of 2035; and the cumulative impacts of growing energy demand from growth associated with implementation of the 2008 RTP.

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.

Impact 3.5-1: The implementation of the 2008 RTP is likely to use electricity, natural gas, gasoline, diesel, and other non-renewable energy types in the construction and expansion of the regional transportation system and development in the region between the current conditions and 2035.

Construction of the new elements of the regional transportation system included in the 2008 RTP would likely 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 would be an irreversible impact from the consumption of diesel fuel (and other fuels) related to these construction activities. The 2008 RTP does not contemplate an increase in the amount of regional transportation system construction beyond what is normally under way and thus, it is unlikely that the energy demands of construction of the new elements of the regional transportation system would create a noticeable impact to regional energy systems. However, it should be noted that the International Energy Agency has forecasted a world oil supply “crunch” in the next five years due to demand outpacing supply, global fuel prices are expected to escalate. As such, many transportation projects could experience unprecedented construction cost increases. Use of energy for construction purposes is anticipated to be **significant**.

85 This threshold is only applicable to the Southern California Association of Governments 2008 RTP PEIR pending future guidance from the Governor's Office of Planning and Research (OPR). SB 97 requires that OPR prepare, develop and transmit guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions as required by CEQA. The Resources Agency would be required to certify or adopt the guidelines by January 1, 2010.

Mitigation Measures

MM-EN.1: In reviewing projects, lead and implementing agencies shall consider energy implications of construction processes. In general the most energy efficient construction process and long-term operational design shall be selected unless there's an overriding reason why not.

Significance after Mitigation

Given the large amount of construction anticipated for the region, the energy that would be consumed by construction is anticipated to be **significant**.

Impact 3.5-2: The implementation of the 2008 RTP is likely to substantially increase the consumption of electricity, natural gas, gasoline, diesel, and other non-renewable energy in the operation of the transportation system and operation of associated growth in the region between the current conditions and 2035.

Operation of the transportation system as described in the 2008 RTP would involve a substantial increase in the use of petroleum fuels between the current conditions and 2035. **Table 3.5-5** summarizes the expected operational increases in fuel usage, as predicted by SCAG's transportation and air quality model, between 2008 and 2035 with the investments in the RTP and without (the No Project Alternative).

TABLE 3.5-5
PROJECTED SCAG REGION TRANSPORTATION FUEL CONSUMPTION (THOUSAND GALLONS PER DAY)

Alternative	Gasoline (1000 gal/day)	Percent Increase over Base Year 2008	Diesel (1000 gal/day)	Percent Increase over Base Year 2008	Total (1000 gal/day)	Percent Increase over Base Year 2008
Existing 2008	19,434.4	--	3,345.6	--	22,780.0	--
2035 No Project	27,732.1	43%	6,614.6	95%	34,246.7	50%
2035 with RTP	26,660.3	37%	6,282.8	88%	32,943.1	45%

SOURCE: SCAG EMFAC Analysis, 2007.

As mentioned in the environmental setting above, there is a potential for a significant dropoff in the amount of economically recoverable petroleum within the next ten years. If this decrease occurs, fuel prices could increase dramatically, and the cost of owning and maintaining a conventional 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.

In addition to increased use of petroleum fuels, projects in the 2008 RTP would be expected to consume natural gas and electricity. As shown in **Table 3.5-6** the region would increase electricity consumption by over 38 billion kWh per year between 2008 and 2035 and increase natural gas

Table 3.5-6
Electricity and Natural Gas Consumption for 2008, 2035 No Project and 2035 w/ Project

	Electricity (Billion kWh/year)			Natural Gas (Billion cubic feet/year)		
County	**Base Year 2008**	**2035 No Project**	**2035 w/ RTP**	**Base Year 2008**	**2035 No Project**	**2035 w/ RTP**
Ventura	5.82	7.35	7.41	37.93	47.84	48.24
Riverside	14.10	26.09	25.43	82.94	154.42	150.60
Imperial	1.61	3.20	3.16	7.12	14.13	13.97
Orange	21.10	24.16	24.35	166.30	190.81	192.19
Los Angeles	70.76	81.28	82.36	468.68	540.34	547.81
San Bernardino	15.96	25.82	24.82	82.47	133.40	128.17
SCAG TOTAL	**129.33**	**167.91**	**167.52**	**845.44**	**1,080.95**	**1,080.97**

Electricity usage rates obtained from the California Energy Commission, California Electricity Consumption by County in 2005. Based on CEC data, electricity usage per capita will remained relatively constant.
Natural gas usage rates from the California Energy Commission, California Energy Demand 2006-2016 Staff Energy Demand Forecast. Based on CEC data, natural gas usage per capita will remain relatively constant.
SOURCE: California Energy Commission and Terry Hayes and Associates.

consumption by 235 billion cubic feet per year during the planning horizon of the RTP. Street lighting for new highways and arterials and nighttime lighting for rail projects would consume electricity. New rail would also require electricity and natural gas during project operation. The energy impacts of rail are dependent on the energy source. If the rail system is powered by electricity generated from renewable sources, the energy impacts would be lessened. In 2006, 15 percent of the electricity consumed in the SCAG was generated from eligible renewables. California currently imports about 31 percent of its annual electricity supply from out-of-state generating units, and about 75 percent of this power (4,744 MW) comes from coal.[86] In response to air quality concerns, particularly efforts to reduce greenhouse gas emissions, it is likely that in the future more buses would use natural gas or alternative, less carbon intense, energy sources instead of petroleum-based fuels for daily operations. In addition, the implementation of mitigation measures identified below would further reduce the significance of these impacts.

Mitigation Measures

In addition to the mitigation measures specified below, mitigation measures identified in the Transportation Section for the impacts of transportation system usage would serve to mitigate the impacts of growing transportation energy demand.

Mitigation Measures for State and Federal Government

MM-EN.2: State and federal lawmakers and regulatory agencies should pursue the design of programs to either require or incentivize the expanded availability and use of alternative-fuel vehicles to reduce the impact of shifts in petroleum fuel supply and price.

86 California Energy Commission, Gross System Power 2006. Retrieved on October 22, 2007 from http://energy.ca.gov/electricity/gross_system_power.html

Mitigation Measures for SCAG

MM-EN.3: SCAG shall continue to consider energy uncertainty impacts prior to the development of the next Regional Transportation Plan. Topics that should 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.

This work will help SCAG better understand the relationship between transportation, land use and energy uncertainty.

MM-EN.4: 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-EN.5: SCAG shall encourage clean post recycle conversion technologies to produce energy or technologies that offset energy use or air emissions.

MM-EN.6: 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-EN.7: 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-EN.8: SCAG shall encourage the Federal Government to increase the Corporate Average Fuel Economy (CAFE) to a level that will reduce our dependence on petroleum and reduce greenhouse gas emissions.

MM-EN-9: 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-EN-10: SCAG shall continue to develop, in coordination with the California Air Resourcs 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-EN.11: SCAG shall continue to work with local jurisdictions and energy providers, through its Energy and Environment Committee and 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.

MM-EN.12: 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 the energy demand and greenhouse gas emissions in the SCAG Region.

Mitigation Measures for Local Agencies

MM-EN.13: Local agencies 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-EN.14: Local agencies 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 should be developed and monitored. SCAG recommends the use of Appendix F, Energy Conservation, of the *CEQA Guidelines.*

MM-EN.15: Local agencies should streamline permitting and provide public information to facilitate accelerated construction of solar and wind power.

MM-EN.16: Local agencies should adopt a "Green Building Program" to promote green building standards. Green buildings can reduce local environmental impacts, regional air pollutant emissions and global greenhouse gas emissions. Green building standards involve everything from energy efficiency, usage of renewable resources and reduced waste generation and water usage. For example, water-related energy use consumes 19 percent of the state's electricity. The residential sector accounts for 48 percent of both the electricity and natural gas consumption associated with urban water use.[87] While interest in green buildings has been growing for some time, cost has been a main consideration as it may cost more up front to provide energy-efficient building components and systems. Initial costs can be a hurdle even when the installed systems will save money over the life of the building. Energy efficiency measures can reduce initial costs, for example, by reducing the need for over-sized air conditioners to keep buildings comfortable. Undertaking a more comprehensive design approach to building sustainability can also save initial costs through reuse of building materials and other means.

A comprehensive study of the value of green building savings is the 2003 report to California's Sustainable Building Task Force. In the words of the report: "While the environmental and human health benefits of green building have been widely recognized, this comprehensive report confirms that minimal increases in upfront costs of about 2% to support green design would, on average, result in life cycle savings of 20% of total construction costs -- more than ten times the initial investment. For example, an initial upfront investment of up to $100,000 to incorporate green building features into a $5 million project would result in a savings of $1 million in today's dollars over the life of the building."[88]

MM-EN.17: Local governments should alter zoning to improve jobs/housing balance and creating communities where people live closer to work, bike, walk, and take transit as a substitute for personal auto travel. Creating walkable, transit oriented nodes would generally reduce energy use and greenhouse gas emissions. Residential energy use (electricity and natural gas) accounts for 14 percent of California's greenhouse gas emissions. It is estimated that households in transit-oriented

87 California Energy Commission, (November 2005) California's Water-Energy Relationship Final Staff Report. Retrieved September 26, 2007 from http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF

88 Greg Kats, Capital E, The Costs and Financial Benefits of Green Buildings, A Report to California's Sustainable Building Task Force, October 2003, http://www.ciwmb.ca.gov/greenbuilding/Design/CostBenefit/Report.pdf, last accessed September 17, 2007.

developments drive 45 percent less than residents in auto-dependent neighborhoods. In addition, mixed land uses (i.e., residential developments near work places, restaurants, and shopping centers) with access to public transportation have been shown to save consumers up to 512 gallons of gasoline per year.[89] Furthermore, studies have shown that the type of housing (such as multi-family) and the size of a house have strong relationships to residential energy use. Residents of single-family detached housing consume over 20 percent more primary energy than those of multifamily housing and 9 percent more than those of single-family attached housing.[90]

Mitigation Measures for Utilities

MM-EN.18: Utilities should install and maintain California Best Available Control Technologies on all power plants at the US-Mexico border.

MM-EN.19: Utilities should consider increasing capacity of existing transmission lines, where feasible.

Mitigation Measures for Project Implementing Agencies/Developers

MM-EN.20: Project sponsors should support programs to reduce single occupancy vehicle trips such as telecommuting, ridesharing, alternative work schedules, and parking cash-outs.

MM-EN.21: Project sponsors should support only the use of the best available technology including monitoring, air, and water impacts for locating any nuclear waste facility.

MM-EN.22: Project sponsors 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 shall be completed according to the specifications of the energy provider.

MM-EN.23: Project sponsors should consider the most cost-effective alternative and renewable energy generation facilities.

MM-EN.24: Project sponsors should ensure that new buildings incorporate solar panels in roofing and tap other renewable energy sources to offset new demand on conventional power sources.

MM-EN.25: Project sponsors should require energy efficient design for buildings. This may include strengthening local building codes for new construction and renovation to require a higher level of energy efficiency.

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89 Transportation Demand Management Encyclopedia. “Transit Oriented Development.” Victoria Transport Policy Institute.

90 Rong, Fang. (2006) Impact of Urban Sprawl on U.S. Residential Energy Use. University of Maryland. Retrieved from http://hdl.handle.net/1903/3848 on September 14, 2007.

MM-EN.26: Project sponsors should fund and schedule energy efficiency "tune-ups" of existing buildings by checking, repairing, and readjusting heating, ventilation, air conditioning, lighting, hot water equipment, insulation and weatherization. (Facilitating or funding the improvement of energy efficiency in existing buildings could offset in part the global warming impacts of new development.)

MM-EN.27: Project sponsors should provide individualized energy management services for large energy users.

MM-EN.28: Project sponsors should require the use of energy efficient appliances and office equipment.

MM-EN.29: Project sponsors should pursue incentives and technical assistance for lighting efficiency.

MM-EN.30: Project sponsors 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-EN.31: Project sponsors 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-EN.32: Project sponsors should incorporate on-site renewable energy production (through, e.g., participation in the California Energy Commission's New Solar Homes Partnership). Require project proponents to install solar panels, water reuse systems, and/or other systems to capture energy sources that would otherwise be wasted.

MM-EN.33: Project sponsors should pursue incentives to encourage the use of energy efficient equipment and vehicles.

MM-EN.34: Project sponsors should provide public education and publicity about energy efficiency programs and incentives.

MM-EN.35: In some instances, a project sponsor may find that measures that will directly reduce a project's greenhouse gas emissions are insufficient. A lead agency may consider whether carbon offsets would be appropriate. The project proponent 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 should ensure that any mitigation taking the form of carbon offsets is specifically identified and that such mitigation will in fact occur.

MM-EN.36: Project sponsors should incorporate and local governments should include the following land use principles that use resources efficiently, eliminate pollution and

significantly reduce waste into their projects, zoning codes and other implementation mechanisms:

- 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-EN.37: Project sponsors and local governments should integrate 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 that should be explored 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=Products.pr_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

Significance after Mitigation

The regional increase in transportation-related energy demand as a result of implementing the 2008 RTP would remain a **significant** impact, even with the above mitigation.

Impact 3.5-3: Implementation of the 2008 RTP has the potential to not fully address the greenhouse gas reduction levels identified in AB 32 (1990 levels by 2020).

As described in Chapter 3.2, Air Quality, the 2008 RTP will increase the amount of greenhouse gases. Although the Plan will produce fewer greenhouse gas emissions than the No Project Alternative, this reduced amount will not fully address the levels identified in AB 32, contributing to the potential threats summarized below.

California is the second largest emitter of GHG emissions in the United States, next to Texas. Only nine nations have greater total emissions than the state of California. In 2004, California produced 492 million gross metric tons of carbon dioxide -equivalent GHG emissions, including imported electricity and excluding combustion of international fuels and carbon sinks or storage.[91]

Global warming scenarios predict a 3 to 10.5˚F rise in temperature for California by 2100. Although many models that attempt to predict future climate scenarios at a smaller scale are still being refined, there is a general consensus that the following impacts due to warming will occur.[92]

Threats to Local Economy

- Although increased CO_2 concentration will have little impact on direct biomass production, the corresponding temperature changes will affect crops that depend on a certain number of winter chill hours to bear fruit. Many types of fruit and nut trees are sensitive to changes in temperature patterns. A decreasing trend in winter chill hours is evident in many parts of the state. Conversely, extended hot periods can cause leaf desiccation and premature ripening of fruits, such as wine grapes.

- Warm temperatures are predicted to expand the range of many agricultural pests, weeds, and pathogens currently held in check by cold temperatures. Many pests are prevented from spreading by their intolerance to winter frosts.

- The lack of snowfall will lead to loss of winter recreation (seen in 2006).

Degrading Air Quality

- Warmer weather will increase the number of days conducive to ozone formation by 25-85 percent, especially in the Los Angeles and San Joaquin Valley. Volatile Organic Compound (VOC) emissions from fuels, solvents, and coatings; NOx emissions from

91 California Energy Commission, Inventory of Greenhouse Gas Emissions and Sinks: 1990-2004 Final Staff Report. (December 2006) CEC-600-2006-013-SF. Retrieved March 26, 2007 from http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF

92 California Energy Commission. Our Changing Climate Assessing the Risks to California (July 2006) CEC-500-2006-077. Retrieved March 26, 2007 from http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF

amplified cooling demands; and enhanced biogenic VOCs from vegetation will also increase as temperatures rise.

- As warming occurs and precipitation patterns change, the fire regime for California will also change. For example, under a warmer, wetter scenario a 30 percent increase in Southern California fires is predicted while a 90 percent increase in Northern California fires is predicted if California climate becomes hotter and drier. The onset and duration of fire season will be earlier and longer. GHG emissions and emissions of fine, particulate matter from fires will add to the overall decrease in air quality.

- It will become even more difficult to meet air quality standards, jeopardizing federal transportation funds.

Water Supply at Risk

- The uncertainty of localized climate models makes it difficult to predict exact rainfall amounts, however many climate scenarios predict a shorter rainy season. Coupled with hotter weather, the overall water consumption for the area (including agricultural consumption) is expected to increase.

- Current climate models predict more precipitation falling as rain and less precipitation falling as snow. Lack of winter snow and a resulting decrease in the Sierra Nevada snow pack, which acts as a natural reservoir, will directly impact water supplies. With much of the summer water supply for the region coming from spring snowmelt, warmer temperatures will cause a later snow season and earlier melting, leaving less water available during the dry summer season. An estimated 30 percent reduction of spring stream flow is predicted under a medium global warming scenario.

- Rising sea levels due to thermal expansion of warmer ocean waters and melting glaciers would degrade estuaries, wetlands, and groundwater aquifers. The contamination of fresh groundwater due to saltwater intrusion is a major concern as sea levels rise. Water pumped from the southern edge of the Sacramento/San Joaquin River Delta is one such water supply at risk of saltwater intrusion.

Threats to Biodiversity and the Environment

- Loss or shift of certain types of ecosystems due to changing temperatures. Increased fire frequency in inland areas is expected to expand grasslands into current shrub and woodland areas. Plants suited to alpine and subalpine regions are expected to decrease 60 to 80 percent.

- A change in the timing of seasonal activities such as breeding and migration will cause chaos for many plant and animal species as earlier plant flowering, insect emergence, and breeding throws off their life cycle. Many species will be driven to extinction as suitable habitat declines.

Threats to Human Health

- As the number of hot days increase, the number of heat-related deaths will increase. This includes death by heat stroke, dehydration, heart attack, stroke, and respiratory distress caused by extreme heat. Those most affected would be the sick, the elderly, young children, and the poor. California averages 36 days of extreme temperatures a year. This average is expected to increase 1.5 to 2.5 times by mid-century.

- The distribution of disease carrying organisms is expected to increase as temperatures warm. For example, Lyme Disease, a common tick-borne disease may spread to areas that were previously uninhabitable for the vector (and disappear from areas it presently inhabits). Other tropical diseases and disease vectors will spread as their habitable range increases due to warmer climate.

- Many California cities are concentrated along the coast and will be put at risk of storm surges, flooding, and coastal erosion as warmer waters fuel more intense winter storms. Flooding also increases the risk of transmission of water-borne diseases.

Given the potentially severe consequences of climate change, the California Climate Action Team (CAT) developed a summary of actions. The report included a list of strategies by responsible agency and estimated their climate change emission reduction potential. The report concluded that the reduction targets identified in Executive Order S-3-05 and AB 32 are achievable. **Table 3.5-7** contains CAT Measures directly related to the long-term transportation system and describes the 2008 RTP's consistency with the measures. The table also identifies the statewide CO_2 reduction potential as summarized in the CAT report. This report also includes a detailed list of potential greenhouse gas emissions mitigation measures recommended by the State's Attorney General. This list, including the location of specific measures and their feasibility is located in **Appendix B**, NOP Comments Regarding Measures to Reduce the Greenhouse Gas Emissions of the Proposed 2008 RTP.

Mitigation Measures

See Mitigation Measures under Impact 3.5-2.

Significance after Mitigation

The impact is **significant** even after mitigation.

TABLE 3.5-7
GREENHOUSE GAS EMISSION REDUCTION STRATEGY CONSISTENCY ANALYSIS

Reduction Strategy	Description	2020 GHG Emission Reductions (Million Tons CO_2 Equivalent)	Consistency Analysis
CARB Reduction Strategy			
Vehicle Climate Change Standards	Reduce GHG emissions emitted by passenger vehicles and light duty trucks	30	Does not address: The energy mitigation program includes best practices and technological improvements that can reduce the consumption of fossil fuels and GHG emissions such as modernizing older engines and equipment. However, using todays emission rates the 2008 RTP could result in an increase in GHG emissions resulting in an inconsistency with the State's plan.
Diesel Anti-idling	Limit diesel fueled commercial motor vehicle idling to 5 minutes or less	1.2	Does not address: While the 2008 RTP will increase investments in non-motorized transportation and maximize the benefit of land use-transportation connections, it will also provide goods movement capacity enhancements which could increase the occurrences of diesel truck idling.
Hydrofluorocarbon Reduction	Low emitting refrigerants used in new vehicles/commercial refrigeration	8.5	Consistent: This measure applies to consumer products. When CARB adopts regulations for these reduction measures, any products that the regulations apply to will comply with the measures.
Public Utilities Commission			
Renewable Portfolio Standard	Accelerate standard to 33% by 2020	11	Does not fully address: The mitigation program includes a provision to increase clean, cost-effective, reliable, domestic renewable energy generation, such as solar and wind turbines. However, the 2008 RTP would increase the demand for electricity in the region. This increase in demand could prohibit the state from reaching its RPS goals by 2020.
California Solar Initiative	Million solar roofs by 2017 on homes/businesses	3	See RPS discussion above.
Investor Owned Utility Energy Efficiency Programs	Energy efficiency incentives	8.8	Consistent: The mitigation program includes a provision 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.
Business Transportation and Housing			
Transportation Energy Efficiency	Framework for expanded incentives, tools and information	9	Does not fully address: The PEIR includes a measure to encourage the Federal Government to increase the Corporate Average Fuel Economy (CAFE) to a level that will reduce our dependence on petroleum and reduce greenhouse gas emissions. However, vehicle miles traveled will increase over the plan horizon, resulting in a potential inconsistency with this measure.
Smart Land Use/Intelligent Transportation System (ITS)	Mixed use, jobs/housing proximity, ITS management	18	Does not fully address: SCAG's Compass Blueprint Program has become a model for turning regional vision into local reality by encouraging efficient land use and growth patterns that complement our transportation investments. These policies have shown to reduce vehicle miles traveled and improved air quality. As a voluntary program, SCAG provides cutting edge tools, analyses and comprehensive planning services to cities that seek help. Services have been sought for over 50 sites in jurisdictions all over the region. Subsequent implementation efforts are in the hands of local governments. The Plan also recommends that SCAG and Transit operators analyze and assess the use of ITS technologies to track, report and improve on-time performance of transit systems. Nonetheless, although these efforts will generally reduce the rate of increase in GHG emissions, the data show an overall increase in GHG in the horizon year 2035, resulting in a potential inconsistency with this measure.

TABLE 3.5-7 (Continued)
GREENHOUSE GAS EMISSION REDUCTION STRATEGY CONSISTENCY ANALYSIS

Reduction Strategy	Description	2020 GHG Emission Reductions (Million Tons CO_2 Equivalent)	Consistency Analysis
State and Consumer Services Agency			
Green Buildings Initiative	Reduce building energy use 20% by 2015	1.8	Does not fully address: The mitigation program includes a measure to develop energy efficiency and green building guidance. Nonetheless, population and households will increase by 2035, and unless energy types change, increasing the demand for energy in buildings.
Environmental Protection Agency			
Alternative Fuels	Biodiesel Blends	Less than 1	Does not fully address: The mitigation program includes a provision for regulatory agencies to pursue the design of programs to either require or incentivize the expanded availability and use of alternative-fuel vehicles to reduce the impact of shifts in petroleum fuel supply and price. However, the 2008 RTP is expected to result in an increase in gasoline (unless fuel efficiency changes dramatically) and diesel usage, inconsistent with the State's plan.
Alternative Fuels	Ethanol	3.2	See Alternative Fuels discussion above.

SOURCE: California Environmental Protection Agency, Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006, SCAG 2007

Cumulative Impact 3.5-4: Implementation of the investments and policies in the 2008 RTP would contribute to a cumulatively considerable increase in the amount of total energy consumed in the SCAG region between 2008 and 2035.

The 2035 transportation model includes the population, households, and employment projected for 2035, and therefore the largest demand on the transportation system expected during the lifetime of the 2008 RTP. In accounting for the effects of regional population growth, the model output provides a regional, long-term and cumulative level of analysis for the impacts of the 2008 RTP on transportation resources. Forecast urban development and growth that would be accommodated by the transportation investments in the 2008 RTP, together with the increased mobility provided by the 2008 RTP, would contribute to the significant impacts described in Impact 3.5-2 above.

As indicated in Impact 3.5-2, forecast urban development and growth that would be accommodated by the transportation investments in the 2008 RTP would entail greater use of energy resources in 2035 than in 2008 for purposes indirectly related to transportation, such as housing and employment. Unless per capita energy consumption rates change, the estimated increase in residential energy consumption is projected to be proportional to the overall increase in regional population.

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 available, 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 RTP includes a more compact growth pattern than the No Project Alternative and is thus anticipated to result in less energy consumption.

Mitigation Measures

See mitigation measures above.

Significance after Mitigation

Even with mitigation, this cumulative impact would remain **significant**.

Comparison With The No Project

In the No Project Alternative, the regional population is projected to be the same as the Plan Alternative, 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 only about 66,000 new lane miles, compared with over 72,000 new lane miles in the Plan Alternative. As shown in Table 3.5-6, the total projected use of transportation fuels would increase in the SCAG region even more in 2035 under the No Project conditions than under the Plan Alternative (an increase of 50% for the No Project vs. 45% for the Plan). This difference would result from the additional travel necessary without the Plan improvements to the regional transportation system. Thus, the No Project Alternative would have an even greater significant impact on regional transportation energy usage (Impact 3.5-2) than would the Plan Alternative. The No Project Alternative could be expected to have a smaller, though still significant, impact on energy needs for construction than the Plan Alternative since fewer new projects would be built.

Cumulative Impacts

Overall transportation energy usage is projected to be greater under the No Project Alternative than under the Plan Alternative because uses would be spread over a greater area resulting in greater VMT. Also the more compact development patterns identified by the Plan Alternative would result in less energy use.

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3.6 Geology, Soils, and Seismicity

This section describes the geology, soils, and seismicity in the SCAG region, identifies the potential impacts of these conditions on projects considered in the 2008 RTP, including mitigation measures for these impacts, and evaluates any residual impacts that would remain, subsequent to mitigation.

Environmental 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 3.6-1**

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 define 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

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. Note 36.

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 US-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 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 aseismic subsidence due to the San Andreas fault system.

Soils

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 3.6-2** shows the general location of soil types contained within the SCAG region. Applicable U.S. Department of Agriculture Natural Resource Conservation Service (USDA-NRCS) soil surveys for specific counties provide the classification and description of each soil type encountered in the SCAG region. **Map 3.10-6** contains the general location of areas considered prime or important farmlands.

Soil Hazards

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.

3 Soil Association – A mapping unit consisting of a group of defined and taxanomic soil units occurring together in an individual and characteristic pattern over a geographic region.

4 United States Department of Agriculture, Soil Conservation Service (SCS). 1970. *Soil survey of Ventura area, California.* Issued April, 1970.

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 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 3.6-3** 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.

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 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. **Map 3.6-4** shows areas within the SCAG region susceptible to landslides.

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 still exceedingly damaging) 1971 San Fernando and 1994 Northridge earthquakes, both classified as magnitude 6.7 earthquakes.[6]

Regional 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.

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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].

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].

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 3.6-1 characterizes the major faults in the SCAG region. **Map 3.6-5** illustrates the geographic location of these faults.

TABLE 3.6-1
CHARACTERIZATION OF MAJOR FAULTS IN THE SOUTHERN CALIFORNIA REGION[7]
(LOS ANGELES, SAN BERNARDINO, RIVERSIDE, ORANGE, IMPERIAL, VENTURA COUNTIES)

Class A Faults

Fault	Counties	Recency[8]	Slip Rate (mm/yr)	Max. Moment[9]
San Andreas	Los Angeles, San Bernardino, Riverside, Imperial	Historic	25.0-34.0	7.2-7.5
San Jacinto-Imperial	San Bernardino, Riverside, Imperial	Holocene, Later Quaternary	4.0-20.0	6.6-7.2
Elsinore	Riverside, Imperial	Holocene	2.5-5.0	6.8-7.1

7 Characterization of the faults in Southern California is derived from documents accessible at the CSGS web page, Probabilistic Seismic Hazard Assessment Maps (PSHA), at: < http://www.conservation.ca.gov/cgs/rghm/psha/ofr9608/Pages/Index.aspx>; see Petersen, et al., 1996. The geographic location of the faults is derived from fault characterizations at the USGS web site for recent earthquake activity at <http://quake.wr.usgs.gov/recenteqs/FaultMaps/118-34.htm>, and also from the list of California and Nevada faults at <http://quake.wr.usgs.gov/info/faultmaps/faultlist.html>.

8 "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." http://quake.wr.usgs.gov/info/faultmaps/slipage.html
Where no recency data is given, no determination has been made.

9 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.

TABLE 3.6-1 (Continued)
CHARACTERIZATION OF MAJOR FAULTS IN THE SOUTHERN CALIFORNIA REGION[10]
(LOS ANGELES, SAN BERNARDINO, RIVERSIDE, ORANGE, IMPERIAL, VENTURA COUNTIES)

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 ZONE				
Garlock-west	San Benardino		6.0	7.1
Garlock-east	San Benardino		7.0	7.3
Owl Lake	San Benardino		2.0	6.5
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	-			
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				
Compton thrust	-		1.5	6.8
Elysian Park	-		1.5	6.7

10 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.
Characterization of the faults in Southern California is derived from documents accessible at the CSGS web page, Probabilistic Seismic Hazard Assessment Maps (PSHA), at: < http://www.conservation.ca.gov/cgs/rghm/psha/ofr9608/Pages/Index.aspx>; see Petersen, et al., 1996. The geographic location of the faults is derived from fault characterizations at the USGS web site for recent earthquake activity at <http://quake.wr.usgs.gov/recenteqs/FaultMaps/118-34.htm>, and also from the list of California and Nevada faults at <http://quake.wr.usgs.gov/info/faultmaps/faultlist.html>.

TABLE 3.6-1 (Continued)
CHARACTERIZATION OF MAJOR FAULTS IN THE SOUTHERN CALIFORNIA REGION[11]
(LOS ANGELES, SAN BERNARDINO, RIVERSIDE, ORANGE, IMPERIAL, VENTURA COUNTIES)

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
TRANSVERSE RANGES AND MOJAVE				
Fault	**Counties**	**Recency**	**Slip Rate (mm/yr)**	**Max. Moment**
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
Fault	**Counties**	**Recency**	**Slip Rate (mm/yr)**	**Max. Moment**
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

SOURCE: 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 and Geology Open-File Report issued jointly with U.S. Geological Survey, CDMG 96-08 and USGS 96-706, 1996. Accessed on June 2007, < http://www.conservation.ca.gov/cgs/rghm/psha/ofr9608/Pages/Index.aspx>

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.

11 Characterization of the faults in Southern California is derived from documents accessible at the CSGS web page, Probabilistic Seismic Hazard Assessment Maps (PSHA), at: < http://www.conservation.ca.gov/cgs/rghm/psha/ofr9608/Pages/Index.aspx>; see Petersen, et al., 1996. The geographic location of the faults is derived from fault characterizations at the USGS web site for recent earthquake activity at <http://quake.wr.usgs.gov/recenteqs/FaultMaps/118-34.htm>, and also from the list of California and Nevada faults at <http://quake.wr.usgs.gov/info/faultmaps/faultlist.html>.

Peak Ground Acceleration

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 Intensity Scale, a common metric for characterizing intensity. The Mercalli Scale is a more descriptive method involving 12 levels of intensity denoted by Roman numerals. As presented in **Table 3.6-2**, Modified Mercalli (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.

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.[12] 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. **Map 3.6-5** identifies potential areas of Probabilistic Ground Acceleration.

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.[13] 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

[12] 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 3.6-1, pg. 3.6-5, for the moment magnitudes associated with particular faults.

[13] California Geological Survey (CGS), *Guidelines for evaluating the hazard of surface fault rupture*, CGS Note 49, 2002a.

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.[14] An indicative map of identified Earthquake Fault Zones delineating potential rupture areas is provided in **Map 3.6-5**. 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.

TABLE 3.6-2
MODIFIED MERCALLI INTENSITY SCALE[15]

- 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.

SOURCE: U.S. Geological Survey, National Earthquake Information Center

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).

[14] "Earthquake Fault Zones" were called "Special Studies Zones" prior to January 1, 1994.
[15] Excerpted from <http://neic.usgs.gov/neis/general/mercalli.html>

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 depth to the water table and are thus less susceptible to liquefaction than unconsolidated alluvium adjacent to stream channels. **Map 3.6-6** 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. (See **Map 3.6-4**, in Map Chapter.)

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.

Mineral Resources

Mineral resource extraction occurs in various portions of California, but is generally limited to non-urban areas. 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.

Regulatory Setting

The regulatory setting describes the federal, state, and local agencies that have jurisdiction over geology, soils, and seismicity. The regulations pertinent to these areas that each of these agencies enforce are also described.

Federal Agencies and Regulations

United States. Department Of Agriculture, 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, or local governments to acquire conservation easements or other interests from landowners.

State Agencies and Regulations

California Department of Conservation

In 1982, the State of California created the Farmland Mapping and Monitoring Program within the California Department of Conservation to provide maps and statistical data for use in planning for the best utilization of California's agricultural resources. The California Land Conservation Act of 1965, also known as the Williamson Act, is designed to preserve agricultural and open space lands by discouraging their premature and unnecessary conversion to urban uses. Williamson Act contracts, also known as agricultural preserves, offer tax incentives for agricultural land preservation by ensuring that land will be assessed for its agricultural productivity rather than its highest and best uses.

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, 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 Uniform Building Code (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. About one-third of the text within the California Building Code has been tailored for California earthquake conditions. Although widely accepted and implemented throughout the United States, local, city and county jurisdictions can adopt the UBC either in whole or in part.

Alquist-Priolo Special Study Zones

The Alquist-Priolo Earthquake Fault Zoning Act of 1971 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.

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 Earthquake Fault Zoning Act.

Surface Mining Area Reclamation Act (SMARA)

SMARA was enacted by the California Legislature to address the need for a continuing supply of mineral resources, and to prevent or minimize the negative impacts of surface mining to public health, property and the environment. SMARA mandates the California Geological Survey (CGS) to provide objective economic-geologic expertise to assist in the protection and development of mineral resources through the land-use planning process. The primary products are mineral land classification maps and reports for urban and non-urban areas of the state. Local agencies are required to use the classification information when developing land-use plans and when making land-use decisions.

California Department of Transportation (Caltrans)

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 corridors 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 SMARA.

Local Agencies and Regulations

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.

Methodology

This section summarizes the methodology used to evaluate the expected impacts associated with geology, soils, and seismicity.

The 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.

Comparison with the No Project

The analysis of geology, soils, and seismicity 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; however, it provides a meaningful perspective on the effects of the 2008 RTP.

Determination of Significance

The methodology for determining the significance of these impacts compares the existing conditions to expected future conditions with the Plan, as required by CEQA Guidelines §15126.2(a). The assessment of geologic impacts was performed by overlaying data in GIS format on the location of areas known to pose seismic or geologic hazards. Specifically, the proposed projects and associated growth of the proposed 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 to either side) was projected along transportation project segments, and taken as a reasonable estimate of land area likely to be directly disturbed by projects considered in the 2008 RTP. The GIS data was then used to determine the proximity of proposed projects, and any associated growth, to potential geologic constraints or features.

Significance Criteria

Criteria for determining significance of impacts were developed from the *CEQA Guidelines* Appendix G. The proposed Plan would have a significant impact on geological resources if its implementation were to:

- 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 issued by the State Geologist, or based on other substantial evidence of a known fault [refer to CGS's Special Publication 42];
    - Strong seismic ground shaking;
    - Seismic-related ground failure, including liquefaction;

  - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located or facilitate growth on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse or be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

Impacts and Mitigation Measures

A summary of the potential impacts of geologic and seismic hazards on proposed regional transportation projects is presented in **Table 3.6-3**, below. A more detailed discussion of the impacts and the potential mitigation measures follows the table.

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.

Impact 3.6-1: Implementation of the 2008 RTP could expose people or structures to potential substantial adverse effects, risk of surface rupture, ground shaking, liquefaction and landsliding or seismically-induced ground shaking or seiche waves.

The entire SCAG region is susceptible to impacts from seismic activity. Seismic events can damage transportation infrastructure through surface rupture, ground shaking, liquefaction, and landsliding. Numerous active faults are known to exist in the region that could potentially generate seismic events capable of significantly affecting existing and proposed transportation facilities. As such, new transportation facilities would be exposed to both direct and indirect effects of earthquakes. Potential effects from surface rupture and severe ground shaking could cause catastrophic damage to transportation infrastructure, particularly overpasses and underground structures.

The 2008 RTP includes highway, arterial, tunnel, HOV, transit, goods movement, and high speed regional transit (HSRT) projects throughout the SCAG region. Highway and arterial projects generally include widening of existing highways and constructing new interchanges, however new highway segments and other capacity enhancement projects are also included in the Plan. New rail lines proposed in the 2008 RTP include Metrolink extensions, light rail projects and HSRT. 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), commuter and light rail routes, and other capacity enhancements proposed in the 2008 RTP would each be susceptible to impacts from seismic activity for at least some portion of their 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 3.6-5**). The HSRT transit system would cross several Alquist-Priolo Zones including the San Andreas Fault Zone as would most highway expansion projects. 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 on soils prone to liquefaction or erosion (such as the High Desert Corridor project) or in landslide-prone areas. **Table 3.6-3** lists RTP 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 to direct impacts on transportation infrastructure, seismic events could damage ancillary facilities such as port facilities, traffic control equipment, and train stations. These 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 landsliding 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.

As with the 1994 Northridge Earthquake, earthquakes can occur within previously undetected fault zones. As such, 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 groundwater levels are altered.

Although seismic activity can cause damage to existing substandard construction, new designs taking account of current engineering knowledge can reduce potential damage and harm. Earthquake-resistant designs employed on new structures can minimize the impact to public safety from seismic events. Nevertheless, new transportation infrastructure and facilities associated with implementation of the proposed 2008 RTP would expose additional people and infrastructure 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 along 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 over-top dam

TABLE 3.6-3
POTENTIAL IMPACTS OF SEISMIC AND GEOLOGIC HAZARDS ON REGIONAL TRANSPORTATION PROJECTS (BY COUNTY)

Imperial County

Project Type	Total # of Projects	No. of Projects potentially affected by geological hazard			
		Ground Acceleration	Erosion	Landslide	Liquefaction
HSRT	0	0	0	NA	NA
HOT Toll	0	0	0	NA	NA
HOV	0	0	0	NA	NA
Mixed Flow	8	2	5	NA	NA
Light Rail	0	0	0	NA	NA
Metrolink (Commuter Rail)	0	0	0	NA	NA
Freight Rail	0	0	0	NA	NA
Transit	0	0	0	NA	NA
Total Projects in County	8				

Los Angeles County

Project Type	Total # of Projects	No. of projects potentially affected by geological hazard			
		Ground Acceleration	Erosion	Landslide	Liquefaction
HSRT	7	1	7	4	7
HOT Toll	5	5	2	1	5
HOV	17	10	10	9	15
Mixed Flow	3		2	1	2
Light Rail	14	4	12	5	13
Metrolink (Commuter Rail)	0				
Freight Rail	3		3	1	3
Transit	28	10	22	14	28
Total Projects in County	77				

Orange County

Project Type	Total # of Projects	No. of projects potentially affected by geological hazard			
		Ground Acceleration	Erosion	Landslide	Liquefaction
HSRT	0				
HOT Toll	11	2	9	9	11
HOV	6	2	2	1	5
Mixed Flow	13	0	6	1	12
Light Rail	0	0	0	0	0
Metrolink (Commuter Rail)	0	0	0	0	0
Freight Rail	2	0	2	1	2
Transit	8	0	4	0	8
Total Projects in County	40				

TABLE 3.6-3 (Continued)
POTENTIAL IMPACTS OF SEISMIC AND GEOLOGIC HAZARDS ON REGIONAL TRANSPORTATION PROJECTS (BY COUNTY)

Riverside County

Project Type	Total # of Projects	No. of projects potentially affected by geological hazard			
		Ground Acceleration	Erosion	Landslide	Liquefaction
HSRT	1	1	1	1	1
HOT Toll	11	2	9	9	11
HOV	8	7	7	0	2
Mixed Flow	9	5	4	0	2
Light Rail	0	0	0	0	0
Metrolink (Commuter Rail)	6	4	6	2	2
Freight Rail	3	2	3	0	0
Transit	5	3	3	0	0
Total Projects in County	43				

San Bernardino County

Project Type	Total # of Projects	No. of projects potentially affected by geological hazard			
		Ground Acceleration	Erosion	Landslide	Liquefaction
HSRT	2	2	0	NA	NA
HOT Toll	0	0	0	NA	NA
HOV	10	8	8	NA	NA
Mixed Flow	12	1	10	NA	NA
Light Rail	0	0	0	NA	NA
Metrolink (Commuter Rail)	2	0	2	NA	NA
Freight Rail	2	1	1	NA	NA
Transit	2	0	2	NA	NA
Total Projects in County	30				

Ventura County

Project Type	Total # of Projects	No. of projects potentially affected by geological hazard			
		Ground Acceleration	Erosion	Landslide	Liquefaction
HSRT	0	0	0	0	0
HOT Toll	0	0	0	0	0
HOV	1	1	1	0	1
Mixed Flow	3	1	3	3	3
Light Rail	0	0	0	0	0
Metrolink (Commuter Rail)	0	0	0	0	0
Freight Rail	0	0	0	0	0
Transit	0	0	0	0	0
Total Projects in County	4				

SOURCE: Southern California Association of Governments, California Geological Survey Seismic Hazard Mapping Program, U.S. Department of Agriculture Natural Resources Conservation Service.
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.

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. 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.

Mitigation Measures

MM GEO-1: Implementing agencies shall ensure that projects are designed in accordance with county and city code requirements for seismic ground shaking. The design of projects shall 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 GEO-2: Implementing agencies shall 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 GEO-3: The project implementing agencies shall ensure that geotechnical analyses from qualified geotechnical experts are conducted within construction areas 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.

Significance after Mitigation

Although projects can employ siting and design standards which consider seismically active areas and Alquist-Priolo fault zones, due to the regional scale of the Plan, the impact remains **significant**.

Impact 3.6-2: Significant earthwork associated with implementation of the 2008 RTP could result in substantial soil erosion and/or the loss of topsoil in some cases potentially resulting in slope failure.

Projects proposed in the 2008 RTP would involve substantial construction of new facilities such as rail lines and highway segments within previously undisturbed areas. Some of these projects could require significant earth work including cuts into hillsides which can become unstable over time, increasing long-term erosion potential. Road cuts can 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 3.6-3**, above, lists the highways on which proposed projects 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. This impact would be **significant**.

Mitigation Measures

MM GEO-4: The project implementing agencies shall ensure that project designs provide adequate slope drainage and appropriate landscaping to minimize the occurrence of slope instability and erosion. Design features shall include measures to reduce erosion caused by stormwater. Road cuts shall be designed to maximize the potential for revegetation.

MM GEO-5: Implementing agencies shall ensure that projects avoid landslide areas and potentially unstable slopes wherever feasible.

MM GEO-5: The project implementing agencies shall ensure that site-specific geotechnical investigations conducted by a qualified geotechnical expert shall 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.

Significance after Mitigation

Given the topography, ecology and meteorology of the SCAG region and the regional scale of the project, the impact will remain **significant**.

Impact 3.6-3: Projects included in the 2008 RTP could be located on expansive soils, a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

Local geology can affect transportation infrastructure. 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. Construction of RTP projects may require significant earthwork and road cuts, increasing the potential for slope failure. In addition, 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. Many of the projects proposed in the 2008 RTP would occur within existing transportation corridors, where expansive soils may have already been removed. However, due to the presence of unstable soils and geologic features throughout the SCAG region, this would be considered a significant impact.

Mitigation Measures

MM GEO-7: The project implementing agencies shall ensure that site-specific geotechnical investigations conducted by a qualified geotechnical expert shall 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, shall be implemented in project designs.

MM GEO-8: Implementing agencies shall 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 GEO- 9: Implementing agencies shall ensure that, prior to preparing project designs, new and abandoned wells are identified within construction areas to ensure the stability of nearby soils.

Significance after Mitigation

Given the underlying geologic features of the SCAG region and the regional scale of the project, the impact will remain **significant**.

Cumulative Impact 3.6-4: Urbanization in the SCAG region would increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation

measures, influences the pattern of this urbanization. Implementation of the 2008 RTP would have the potential to result in a cumulatively considerable adverse effect on human beings and property when considered at the regional scale.

Potentially hazardous geological and seismic factors are found throughout Southern California. Given the regional scale and growth-inducing nature of the projects and programs included in the 2008 RTP the cumulative impacts of the 2008 RTP on geological units and soils as well as the potential exposure to substantial adverse effects to people and property would be **significant**.

Mitigation Measures

Mitigation measures MM.GEO-1 through MM.GEO-9 would be applied to this impact in addition to the following measure:

MM GEO-10: Future impacts to geological resources shall be minimized through cooperation, information sharing, and regional program development as part of SCAG's ongoing regional planning efforts. Resource agencies, such as the USGS, shall be consulted during this update process.

Significance after Mitigation

The impacts to geological resources due to regional scale growth would be reduced through application of the mitigation measures, however the 2008 RTP's accommodation of an additional 5.14 million more people to the SCAG region by 2035 would contribute to cumulative impacts. Impacts to geological resources from the 2008 RTP would be cumulatively considerable.

Comparison with the No Project

Under the No Project alternative, the population of the SCAG region would grow by 5.14 million people, however no regional transportation investments are made above the existing programmed projects. The population distribution follows 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. Therefore fewer areas would be impacted by excavation and construction activities. The Plan includes the construction of a greater number of transportation projects than the No Project. The increase earthwork associated with the Plan could result in greater soil instability and erosion impacts. However, at the regional level, the No Project and the Plan accommodate the same increase in population. Therefore, both the No Project and the Plan would expose the same number of people to potential seismic hazards. Due to these competing factors, and the general seismic activity of the Southern

California region, *the proposed 2008 Plan's impacts to geological resources would be similar to the No Project alternative*.

Cumulative Impacts

The No Project Alternative is expected to accommodate the same increase in total population as the proposed 2008 Plan. The 2008 Plan includes land use strategies that focus development in existing and emerging centers, along transportation corridors and promotes transit-oriented and mixed use development. The No Project would result in more acres of land consumed (approximately 655,000 compared to 200,000 under the Plan) and would likely result in a more spread out growth pattern than the 2008 RTP which focuses on development in existing centers. This spread out growth pattern, could result in the utilization of lands that are geologically unstable, putting persons and structures at risk of potential injury. However, both the Plan and the No Project would expose the same number of people to potential geologic hazards. *The No Project alternative's cumulative impacts to geological resources would be greater than those of the 2008 RTP.*

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3.7 Hazardous Materials

This section describes the impacts associated with Hazardous Materials that could result from the Plan, including hazardous materials transportation and potential releases to the environment, and the associated risks within the SCAG region. This section identifies the potential impacts of the RTP and includes mitigation measures for the impacts, and evaluates the residual impacts.

Environmental 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 that would result from the proposed projects.

Definitions

The universe of hazardous materials is large and diverse. The term “hazardous material” can have varying definitions for different regulatory programs. For the purposes of this PEIR, the term “hazardous materials” refers to both hazardous materials and hazardous wastes. The California Health & Safety Code §25501(k) 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.”

A waste is hazardous if it exhibits one or more of the characteristics defined 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.

1 Title 22 C.C.R. § 66261.3, “Hazardous Waste”
2 Title 22 C.C.R. §§66261.20-66261.24, “Hazardous Waste”

- 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 in the SCAG Region

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 1980's, most land disposal of chemicals was unregulated, with the result that numerous industrial properties and public landfills became dumping grounds for unwanted chemicals. The largest and most contaminated of these sites, in general, became federal Superfund sites in the early 1980's, so named for their eligibility to receive cleanup money from a federal fund established for that purpose under CERCLA. Sites are added to the National Priorities List following a hazard ranking system. The EPA maintains this list of federal Superfund sites, as well as a more extensive list of all sites with potential to be listed known as CERCLIS (Comprehensive Environmental Response, Compensation, and Liability Information System).

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 1980's. Another category of sites, which may have some overlap with the types already mentioned, is brownfields – previously used, often abandoned sites that because of actual or suspected contamination, are undeveloped or underused. Both the U.S. EPA 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.

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. On January 31, 2006, DTSC launched its new Brownfields site database, EnviroStor, which provides similar information to CalSites, with information, 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** breaks down the total number of sites listed in DTSC databases for the six counties that comprise the SCAG region.

TABLE 3.7-1
NUMBER OF CLEANUP SITES BY COUNTY

County	Federal Superfund (NPL)[3]	School Cleanup[4]	State Response[5]	Voluntary Cleanup[6]	Total
Imperial	1	0	7	5	**13**
Los Angeles	14	100	139	179	**432**
Orange	3	13	17	17	**50**
Riverside	4	7	21	12	**44**
San Bernardino	4	9	21	18	**52**
Ventura	2	3	12	14	**31**

SOURCE: Department of Toxic Substances Control – EnviroStor website. 2007. Retrieved October 2007 http://www.envirostor.dtsc.ca.gov/public/default.asp

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 list – data for specific parts of the state is also maintained by the Regional Water Quality Control Boards (RWQCB)
- Cal/EPA
  - Annual Work Plan – indicates which sites are targeted for cleanup using state funds.

Underground Storage Tanks[7]

An underground storage tank system (UST) is a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. The federal UST regulations apply only to underground tanks and piping storing either petroleum or certain

3 Federal Superfund (NPL): Identifies where the U.S. EPA proposed, listed or delisted a site on the National Priorities List (NPL).

4 School Cleanup: Identifies proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination.

5 State Response: Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high-potential risk.

6 Voluntary Cleanup: Identifies with either confirmed or unconfirmed releases, and the project proponents have requested that DTSC oversee evaluation, investigation and/or clean up activities and have agreed to provide coverage for DTSC's costs.

7 United States Environmental Protection Agency website. Last updated October 23, 2007. *Overview of Federal Underground Storage Tank Program.* Retrieved October 2007 from http://www.epa.gov/OUST/overview.htm.

hazardous substances. When the UST program began, there were approximately 2.1 million regulated tanks in the U.S. Today, there are far fewer 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). EPA estimates about 25,000 tanks hold hazardous substances covered by the UST regulations.

The greatest potential hazard from a leaking UST 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 leaking UST 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 and Leaking Underground Fuel Tanks (LUFTS) within the SCAG region.

TABLE 3.7-2
UNDERGROUND STORAGE TANKS

County	UST
Imperial	87
Los Angeles	4938
Orange	2964
Riverside	825
San Bernardino	988
Ventura	382

SOURCE: California Environmental Protection Agency, State Water Resources Control Board website. Retrieved October 2007 from http://geotracker.waterboards.ca.gov/.

Hazardous Materials Transport

There are several ways in which the transportation-related use of hazardous materials poses a risk to residents of 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 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 2.2 billion tons of hazardous materials shipments in the U.S. in 2002. **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 five percent of shipments.[8]

TABLE 3.7-3
HAZARDOUS MATERIAL SHIPMENT RATES IN THE UNITED STATES

Mode	Total Commercial Freight Activity (million tons)	Hazardous Materials Shipped (thousand tons)	Percent of Hazardous Materials Shipped
Truck	11,712	1,159.5	53%
Pipeline	3,529	661.4	30%
Rail	1,979	109.4	5%
Water	1,668	228.2	10%

SOURCE:

United States Department of Transportation, Bureau of Transportation Statistics. 2002. *Commodity Flow Survey*. Retrieved October 2007 from http://www.bts.gov/publications/freight_in_america/html/table_06.html.

United States Department of Transportation, Bureau of Transportation Statistics. 2002. *Hazardous Materials Shipments by Mode*. Retrieved October 2007 from http://www.bts.gov/publications/freight_in_america/html/table_06.html.

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 United States Department of Transportation's Hazardous Materials Information System, in 2006, highways accounted with the largest share of hazardous materials incidents, with a total of 17,666 incidents or 83 percent. Air accounted 11 percent for the next largest portion, followed by rail and water. **Figure 3.7-1** below breaks down transportation related hazardous materials incidents by mode.[9]

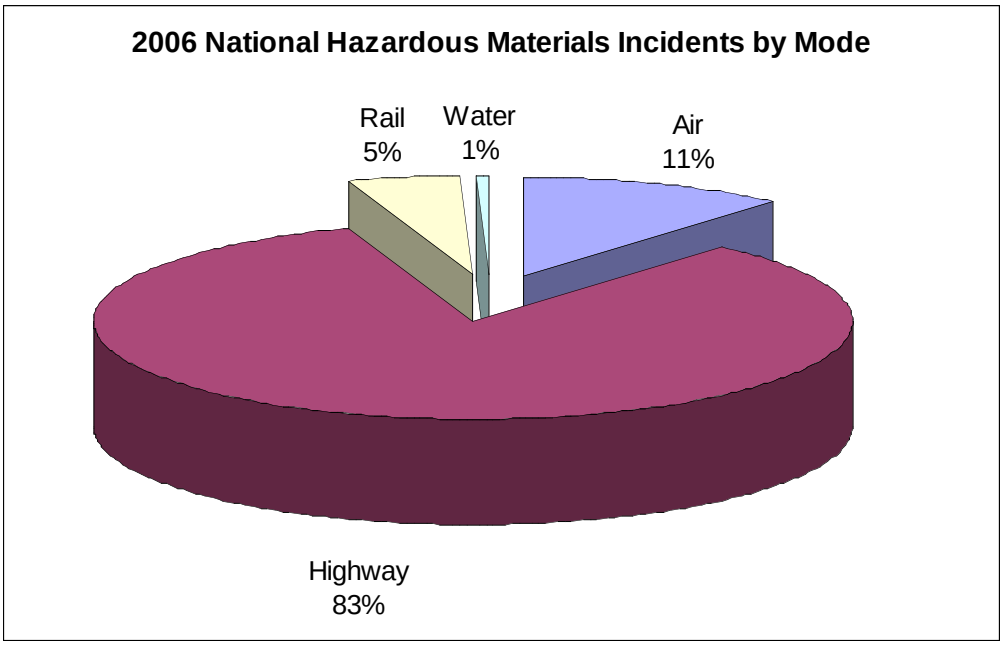
Regulatory Setting

Numerous laws and regulations at all levels of government serve to minimize the potential impacts associated with the use and handling of hazardous materials. The most relevant federal, state, and local hazardous materials laws and regulations are summarized in this section.

8 U.S. Department of Transportation, Bureau of Transportation Statistics. Commodity Flow Survey (2002.) Available at: http://www.bts.gov/publications/freight_in_america/html/table_06.html

9 Office of Hazardous Materials Safety. Summary of Hazardous Materials Transportation Incidents (2002-2003). Available at: http://hazmat.dot.gov/pubs/inc/data/2003/sum/2003ex6-1_6-2.pdf

FIGURE 3.7-1
2006 NATIONAL HAZARDOUS MATERIALS INCIDENTS BY MODE



SOURCE: United States Department of Transportation, Hazardous Materials Information System. 2006. *2006 Hazmat Summary by Mode of Transportation*. Retrieved October 2007 from http://hazmat.dot.gov/pubs/inc/data/2006/2006cause_mode.pdf.

Federal Agencies and Regulations

United States Environmental Protection Agency (EPA)

The EPA is the primary federal agency charged with protecting human health and with safeguarding the natural environment: air, water, and land. EPA works to develop and enforce regulations that implement environmental laws enacted by Congress. EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and tribes the responsibility for issuing permits and for monitoring and enforcing compliance. Since 1970, the EPA has enacted numerous environmental laws including the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); and the Toxic Substances Control Act (TSCA).

Resource Conservation and Recovery Act (RCRA)

The 1976 Resource Conservation and Recovery Act (RCRA) is the principle federal law that regulates generation, management, and transportation of waste. RCRA gave the EPA authority to develop strict requirements for all aspects of hazardous waste management including the treatment, storage, and disposal of hazardous waste. In addition, RCRA requires the inspection,

enforcement, and formal corrective action for facilities that do not live up to the terms of their permits and other requirements. To achieve these goals, RCRA established three programs:[10]

- Subtitle D (Solid Waste Program): Encourages states to develop comprehensive plans to manage non-hazardous industrial solid waste and municipal solid waste, sets criteria for municipal solid waste landfills and other solid waste disposal facilities, and prohibits the open dumping of solid waste.
- Subtitle C (Hazardous Waste Program): Establishes a system for controlling hazardous waste from the time it is generated until its ultimate disposal ("cradle to grave").
- Subtitle I (UST Program): The underground storage tank (UST) program regulates the design and operation of underground storage tanks containing hazardous substances and petroleum products.

A cornerstone of RCRA is management of waste “from cradle to grave,” in other words, from generation, to transportation, treatment, storage, and ultimately, disposal. To assure this, the RCRA utilizes a manifest system, which is a data sheet that identifies each waste shipment. Identification from generators and transporters, and permits for Toxic Substance Disposal Facilities (TSDFs) is required, enabling waste shipments, such as special hazardous waste, to be tracked. The manifest will accompany the waste from the generating facility to the final disposal site, thus, allowing for "cradle to grave" tracking of the waste.

Hazardous Materials Transportation Act

The U.S. Department of Transportation (DOT) regulates hazardous materials shipping at the federal level (49 CFR Parts 171-180). Congress passed the Hazardous Materials Transportation Act in 1975 to give authority to the Secretary of Transportation “to provide adequate protection against the risks to life and property inherent in transporting hazardous materials in commerce.”[11]

Research and Special Programs Administration (RSPA)

The RSPA of DOT issues the hazardous materials regulations. The regulations cover definition and classification of hazardous materials, communication of hazards to workers and the public, packaging and labeling requirements, operational rules for shippers, and training. They apply to interstate, intrastate, and foreign commerce by air, rail, ships, and motor vehicles, and also cover hazardous waste shipments. The Federal Highway Administration (FHWA) is responsible for highway routing of hazardous materials and highway safety permits. The U.S. Coast Guard regulates bulk transport by vessel.

The hazardous material regulations include emergency response provisions, including incident reporting requirements. Reports of major incidents go to the National Response Center, which in

[10] United States Environmental Protection Agency. 40 CFR Parts 238-282. Retrieved October 2007 from http://www.epa.gov/rcraonline/.

[11] United States Department of Transportation. 49 CFR Parts 171-180. Retrieved October 2007 from http://hazmat.dot.gov/regs/rules.htm.

turn is linked with CHEMTREC, a service of the chemical manufacturing industry that provides details on most chemicals shipped in the U.S.[12]

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

CERCLA (generally referred to as Superfund) was enacted by Congress on December 11, 1980. CERCLA established a trust fund to provide for toxic waste cleanup when no responsible party could be identified. Additionally, this Act gave EPA power to seek out those parties responsible for any release and assure their cooperation in the cleanup. The law authorizes two kinds of response actions:[13]

- Short-term Removals: Actions are taken to address releases or threatened releases requiring prompt response.
- Long-term Remedial Response: Actions are taken to permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. These actions can be conducted only at sites listed on EPA's National Priorities List (NPL).

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)

The Superfund Amendments and Reauthorization Act (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.

Emergency and Community Right to Know Act (EPCRA)

Also known as Title III of SARA, EPCRA was enacted by Congress as the national legislation on community safety. This law was designated to help local communities protect public health, safety, and the environment from chemical hazards. EPCRA was passed in response to concerns regarding the environmental and safety hazards posed by the storage and handling of toxic chemicals. EPCRA establishes requirements for federal, state and local governments, tribes and industry regarding emergency planning and “Community Right-to-Know” reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help increase the public’s

12 CHEMTREC website. 2007. Retrieved October 2007 from http://www.chemtrec.org/Chemtrec/.

13 United States Environmental Protection Agency website. Last updated July 17, 2007. *CERCLA Overview*. Retrieved October 2007 from http://www.epa.gov/superfund/policy/cercla.htm.

knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment.

To implement EPCRA, Congress required each state to appoint a State Emergency Response Commission (SERC). The SERC's were required to divide their states into Emergency Planning Districts and to name a Local Emergency Planning Committee for each district.

Toxic Substances Control Act (TSCA)

The Toxic Substances Control Act (TSCA) of 1976 was enacted by Congress to give EPA the ability to track the 75,000 industrial chemicals currently produced or imported into the United States. EPA repeatedly screens these chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk.

State Agencies and Regulations

The identification and cleanup, or remediation, of environmentally contaminated properties is regulated by several agencies in California, depending on the size and nature of the site, its past uses, and whether soil or groundwater are impacted.

California Environmental Protection Agency (Cal/EPA)

The Cal/EPA was created in 1991 by Governor's Executive Order. The six agencies (Air Resources Board, Department of Pesticide Regulation, Department of Toxic Substances Control, Integrated Waste Management Board, Office of Environmental Health Hazard Assessment and the State Water Resources Control Board) were placed within the Cal/EPA "umbrella" to create a cabinet level voice for the protection of human health and the environment and to assure the coordinated deployment of state resources.

California Department of Toxic Substances Control (DTSC)

In California, the DTSC regulates hazardous waste in California primarily under the authority of RCRA and the California Health and Safety Code. The DTSC regulates hazardous waste, cleans-up existing contamination and researches ways to reduce the hazardous waste produced in California. In addition, the DTSC develops legislation, coordinates with lawmakers and responds to constituent complaints. The regulations spell out what those who handle hazardous waste must do to comply with the laws.

Under RCRA, DTSC cleans-up or oversees approximately 220 hazardous substance release sites at any given time and completes an average of 125 cleanups each year. Ensuring compliance through inspection and enforcement is an important part of effectively regulating hazardous waste. DTSC conducts roughly 200 inspections a year. DTSC's Criminal Investigations Branch has the only law enforcement officers in the Cal/EPA. These peace officers, with the powers of arrest, and search and seizure, investigate alleged criminal violations

of the Hazardous Waste Control Law. They work closely with district attorneys' offices, the federal Environmental Protection Agency, the Federal Bureau of Investigation, and law enforcement personnel in other states.

The California Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act) requires that any business that handles hazardous materials prepare a business plan, which must include the following:[14]

- Details, including floor plans, of the facility and business conducted at the site.
- An inventory of hazardous materials that are handled or stored on site.
- An emergency response plan.
- A safety and emergency response training program for new employees with annual refresher courses.

Hazardous Transportation Materials Regulations

Transportation and use of hazardous materials are the concern of several state and local agencies, including Caltrans, which tracks hazardous materials spills at the District level; the California Highway Patrol (CHP), whose Commercial Vehicle Section includes a Motor Carrier/Licensing & HazMat Regulations Unit; and the state Office of Emergency Services, which responds to hazardous materials emergencies in cooperation with local responders. In addition, state law has established Certified Uniform Program Agencies (CUPA), often housed within local fire departments, to oversee local hazardous materials storage, usage, and disposal.

California Unified Program Agency (CUPA)

In 1993, the CUPA was created by SB 1082 in order to simplify the process of regulating and managing hazardous materials and hazardous wastes. Rather than having numerous state and local agencies regulating a single business, SB 1082 consolidated the enforcement of several different environmental regulations under the administration of one local agency called a CUPA. The CUPA can be a county, city or JPA (Joint Powers Authority).[15]

Under SB 1082, the state required all counties to apply for status as a CUPA. In order to address the needs of cities, some of which already had strong environmental inspection programs in place, the law allowed cities to opt in to the CUPA program as long as they could show that they had the minimum expertise and training to implement the six program elements. Each CUPA, whether housed in a Fire Department, Environmental Health Department, or some other department within the city or county would consolidate six existing environmental regulation programs with the goal of reducing: 1) the number of regular inspections to each site by combining different inspections into a single visit, and 2) the amount each regulated business

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14 Governor's Office of Emergency Services. June 2005. *Hazardous Materials Business Plan.* Retrieved October 2007 http://www.oes.ca.gov/Operational/OESHome.nsf/PDF/HazMat%20FAQ/$file/FAQBusPlan6-22-05.pdf

15 Dang, Duy, Celeste Drake, and P. Pamela Meesri. March 27, 2001. *Certified Unified Program Agencies: On the Road to Improving California's Environmental Health.* Retrieved October 2007 from http://www.spa.ucla.edu/ps/research/CUPA.pdf

paid in inspection fees. The six programs include the following: 1) Hazardous Materials Business Plan/Emergency Response Plan; 2) Hazardous Waste/Tiered Permitting; 3) Underground Storage Tanks; 4) Aboveground Storage Tanks (SPCC only); 5) California Accidental Release Program; and 6) the Uniform Fire Code Hazardous Materials Management Plan. The CUPA designates a Participating Agency (PA) to administer one or more Unified Programs within their jurisdiction on behalf of the CUPA. As of January 2007, there are a total of 14 CUPAs and 26 PAs in the SCAG region.[16]

Methodology

This section summarizes the methodology used to evaluate the expected impacts from hazardous materials associated with implementation of the proposed Plan. Since shipments are an indicator of risk, as stated by the OHMS, the impact of hazardous materials transportation through the SCAG region was assessed by examining the 2008 RTP's effect on hazardous materials shipments.

GIS was used to analyze where major freeway, rail, and transit projects in the 2008 RTP come within a one-quarter mile radius of a school. A half-mile buffer (one quarter mile on either side) was drawn around the freeway, rail, and transit projects in the 2008 RTP to compute the number of schools potentially affected by the projects in the 2008 RTP.

Comparison with the No Project

The analysis of hazardous materials also 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 comparison to existing conditions); however, it provides a meaningful perspective on the expected effects of the 2008 RTP.

Determination of Significance

The methodology for determining significance applies the significance criteria below to compare the existing conditions to the expected future conditions with the Plan.

Significance Criteria

Criteria for determining significance of impacts were developed from the *CEQA Guidelines* Appendix G. The proposed Plan would have a significant impact if implementation would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of 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;

16 Certified Unified Program Agency. January 26, 2007. *Local Agency Contact List*. Retrieved October 2007 from http://www.calcupa.net/index.html.

- 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
- Cause a cumulatively considerable hazard to the public or the environment outside the SCAG region.

Impacts and Mitigation Measures

Implementation of the 2008 RTP would affect the transportation and handling of hazardous materials in the SCAG region. Expected significant impacts include risk of accidental releases due to an increase in the transportation of hazardous materials and the potential for such releases to reach schools within one-quarter mile radius of transportation facilities affected by the 2008 RTP.

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.

Impact 3.7-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

The proposed 2008 RTP includes projects that may involve the transportation, use, and/or disposal of hazardous materials, particularly the proposed freight rail improvements and other goods movement capacity enhancements, which may result in transport of hazardous goods as well as the use of equipment that contains or uses routine hazardous materials (e.g., diesel-fueled equipment), or the transportation of excavated soil and/or groundwater containing contaminants from areas that are identified as being contaminated.

It is anticipated that these activities would result in a less than significant hazard to the public and/or the environment, because these activities 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, the Occupational Safety and Health Administration (OSHA), USDOT, and the Food and Drug Administration (FDA) for the federal government. State agencies, including the Health and Welfare Agency (HWA), under which is the DTSC, have parallel, and in some cases more stringent, rules governing the use of hazardous materials.

USDOT requires the use of hazardous waste manifests which are used to ensure that hazardous wastes are strictly monitored and tracked from the point of generation through ultimate disposal. 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 United States Department of Transportation Regulations.

In addition, the construction and maintenance of transportation facilities included in the 2008 RTP would involve the use of hazardous materials such as solvents, paints and other architectural coatings. The use and storage of these materials will be regulated by local fire departments, CUPAs, and the California Division of Occupational Safety and Health. Materials left over from construction projects can likely be re-used on other projects. For materials that cannot be or are not reused, disposal would be regulated by the DTSC under state and federal hazardous waste regulations.

Due to the strict and numerous regulations governing the use of hazardous materials, impacts are expected to be **less than significant**. The following mitigation measure is included to ensure compliance with applicable regulations.

Mitigation Measures

MM-HM.1: The project implementation agency shall 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.

Significance after Mitigation

The mitigation measure would assure appropriate steps taken to minimize any hazard to the public or the environment. The impact after mitigation would be **less than significant**.

Impact 3.7-2: The implementation of the 2008 RTP could 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 2008 RTP would facilitate the movement of goods, including hazardous materials, through the region. For example, by 2035 the RTP includes over 71,866 new regional lane miles and predicts a substantial increase in vehicle miles traveled (VMT) by trucks, a common mode of hazardous materials transport. In addition, freight rail improvements 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 2008 RTP. SCAG's Travel Demand Model suggests that daily regional truck vehicle miles traveled (VMT) will increase from 28.1 million in 2003 to 51.3 by 2035, which is an 82.7 percent increase.

The past several RTP updates 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 in the 2008 RTP would generally improve transportation safety, thus reducing the likelihood of hazardous material transportation incidents. Specific elements in the Plan, such as dedicated truck facilities, could be expected to reduce the level of risk posed by hazardous materials transport by separating trucks from other traffic types. This separation should reduce the likelihood of accidents due to the different acceleration rates and driving patterns of heavy trucks compared with other vehicles. (However, the provision of dedicated capacity enhancement facilities might also provide an incentive for even greater goods shipment through the SCAG region, thus potentially offsetting this benefit.) Likewise, the imposition of tolls or fees to help finance dedicated capacity enhancement facilities may induce the transfer of some freight, including hazardous materials, to rail rather than truck. Federal statistics, however, show that hazardous materials incidents are much less common by rail than on highways.[17]

Given the large volume of materials currently and projected to be transported through the region, some portion of which is and will continue to be, hazardous, the risk of upset as a result of accident or human interference is **significant**.

Mitigation Measures

MM-HM.2: SCAG shall encourage the USDOT, the Office of Emergency Services, and Caltrans to continue to conduct driver safety training programs and encourage the private sector to continue conducting driver safety training.

MM-HM.3: SCAG shall encourage the USDOT and the CHP to continue to enforce speed limits and existing regulations governing goods movement and hazardous materials transportation.

Significance after Mitigation

The improvements to the regional transportation system by 2035 would facilitate a substantial increase in the transportation of all goods, including hazardous materials. However, even with the above mitigation, this impact would remain **significant**.

Impact 3.7-3: The implementation of the 2008 RTP could create a hazard to the public or the environment by emitting hazardous materials within one-quarter mile of a school.

Using SCAG's GIS, the 2008 RTP network of projects was overlaid on the region to determine where impacts could occur to schools. The results of the GIS analysis show that under the Plan, approximately 378 schools are within a half-mile buffer of the 2008 RTP projects and could be impacted. Hazardous materials carried on these roadways could affect these schools if there were to be a release or incident during transportation.

[17] Office of Hazardous Materials Safety. 2006. *2006 Hazmat Summary by Mode of Transportation*. Retrieved October 2007 from http://hazmat.dot.gov/pubs/inc/data/2006/2006cause_mode.pdf.

This impact is considered to be **significant**.

Mitigation Measures

Mitigation measures identified above to reduce risk of upset would also apply to this impact.

MM-HM.4: Prior to approval of any RTP project, the Lead Agency for each individual project shall consider existing and known planned school locations when determining the alignment of new transportation projects and modifications to existing transportation facilities.

Significance after Mitigation

The improvements to the regional transportation system by 2035 would facilitate a substantial increase in the transportation of all goods, including hazardous materials. Even with the above mitigation, this impact would remain **significant**.

Impact 3.7-4: The implementation of the 2008 RTP could 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.

Construction of the projects in the 2008 RTP could involve construction through or next to sites that are contaminated due to past use or disposal of hazardous materials. In the two decades since federal and state laws were adopted providing for remediation of these sites, 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 in the region there are substantial numbers of contaminated sites, and it is likely that most RTP projects will have to address this issue.

Because of the large number of contaminated sites and the risk associated with encountering and cleaning up these sites, this impact is considered to be **significant**.

Mitigation Measures

MM-HM.5: Prior to approval of any RTP project, the project implementation agency shall consult all known databases of contaminated sites and undertake a standard Phase 1 Environmental Site Assessment in the process of planning, environmental clearance, and construction for projects included in the 2008 RTP. If contamination is found the implementing agency shall coordinate clean up and/or maintenance activities.

MM-HM.6: Where contaminated sites are identified, the project implementation agency shall 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.

Significance after Mitigation

The mitigation measure would assure that contaminated properties are identified and appropriate steps taken to minimize human exposure and prevent any further environmental contamination.

The impact after mitigation would be **less than significant**.

Cumulative Impact 3.7-5: The 2008 RTP would contribute a cumulatively significant amount of hazardous material transportation impacts to areas outside of the SCAG region.

The 2035 transportation model includes the population, households, and employment projected for 2035, and therefore the largest demand on the transportation system expected during the lifetime of the 2008 RTP. The forecasted urban development and growth that would be accommodated by the transportation investments in the 2008 RTP and the increased mobility provided by the 2008 RTP would contribute to the significant impacts described above. The regional growth, and thus, cumulative impacts are captured in the analysis presented above.

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 2008 RTP would contribute to significant hazardous material transportation impacts in these other counties.

This impact is considered to be **significant**.

Mitigation Measures

Mitigation Measures **MM-HM. 1 through MM-HM.6** as implemented by local planners and private developers would address this impact.

Significance after Mitigation

Even with the above mitigation, the regional contribution to potential impacts outside the region would remain **significant.**

Cumulative Impact 3.7-6: Implementation of the investments and policies in the 2008 RTP could create a potential hazard to the public or the environment by the disturbance of contaminated sites as a result of population and housing growth in the region.

The 2008 RTP's influence on mobility and its land use-transportation measures would influence population distribution, potentially contributing to a cumulatively considerable impact related to disturbance of contaminated sites by new urban development. With additional pressure for infill development, reuse of "brownfields" properties may become more common as the region grows.

This impact is considered to be **significant**.

Mitigation Measures

Mitigation Measures **MM-HM. 1 through MM-HM.6** as implemented by local planners and private developers would address this impact.

Significance after Mitigation

With appropriate review and clean up or maintenance, this impact would not be cumulatively considerable and therefore would be **less than significant**.

Comparison with the No Project

Implementation of the 2008 RTP 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 24 million. 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.

Direct Impacts

The No Project Alternative would result in the construction of approximately 65,941 new lane miles compared with over 71,866 new lane miles in the Plan Alternative. As a result, new transportation projects in the No Project Alternative would be within a quarter-mile radius of 348 schools, which would be 30 less schools under the Plan Alternative. 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 and therefore in the associated risks. However, without the transportation system improvements incorporated in the 2008 RTP, VMT and VHT would increase more by 2035 for the No Project Alternative than for the Plan Alternative. Thus, there would be more opportunities for accidents with vehicles transporting hazardous materials in the No Project Alternative than in the Plan Alternative. Also, with fewer new roadways constructed, hazardous materials transport would be concentrated on existing routes, and could not be diverted to dedicated lanes.

The Plan impacts would be greater than the No Project impacts for Impacts 3.7-1, 3.7-2, 3.7-3, and 3.7-4.

Cumulative Impacts

With the construction of fewer new lane miles and other transportation projects in the No Project Alternative compared to the Plan, more transportation demand would be transferred to surrounding counties, and therefore, more hazardous materials transportation would be facilitated in these counties. Thus, the No Project impacts would be greater than the Plan impacts for Cumulative Impact 3.7-5. The Plan Alternative 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 Alternative than the No Project Alternative.

Therefore, the No Project impacts would be less than the Plan impacts for Cumulative Impact 3.7-6.

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3.8 Land Use

This section describes the current land use in the SCAG region, identifies the potential impacts of the RTP on land use, includes mitigation measures for the impacts, and evaluates the residual impacts.

Environmental 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 and a population of 19 million people[1]. **Map 3.8-1** depicts the year 2005 land uses in the region.

Urban development 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 3.8-2**.

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, and Century City. In the other five counties within the SCAG region, urban centers exist in the cities 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 has undertaken the Riverside County Integrated Project “to create a high quality, balanced, and sustainable environment for the citizens of Riverside County and to make

[1] SCAG projections for 2008 indicate a population total of 18,909,603

Riverside County's communities great places to live, work, and play."[2] The County of Ventura and cities within the county have enacted SOAR (Save Open-Space and Agricultural Resources) initiatives that, in effect, draw urban growth boundaries as a way to channel future development.[3] 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, there are also 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.

The following sections describe 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 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.

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2 Riverside County Integrated Project. (n.d.). *Why RCIP?* Retrieved December 5, 2007, from http://www.rcip.org/whyrcip.htm.

3 Save Our Open Space and Agricultural Resources. (n.d.). *SOAR FAQ*. Retrieved December 5, 2007, from http://www.soarusa.org/FAQs.html.

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.

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 3.8-3 displays 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. Los Angeles International Airport 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 I-5 and I-405) and the “Orange Crush” (intersection of Interstate 5 (I-5), State Route 22 (SR-22), and State Route 57 (SR-57)) in Orange County. Office developments also cluster around two large universities in the region, the Westwood area around the University of California-Los Angeles and the Irvine Spectrum near the University of California-Irvine.

Map 3.8-4 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 Los Angeles International Airport. A third port in the region, Port Hueneme in Ventura County, is also

surrounded with industrial activity. Along the Mexican border, the three ports of entry in Imperial County see 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. Across southern Los Angeles County, oil wells and oil refineries remain. 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. Industrial land uses are identified on **Map 3.8-1**.

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.[4]

- 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
- Twentynine 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

4 California military bases: Bases by county. Retrieved May 22, 2007, from U.S. Senator Barbara Boxer Web site: http://boxer.senate.gov/CAbases/county.cfm.

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 region.

Regulatory Setting

The regulatory setting describes the federal, state, and local agencies that have jurisdiction over land use. The regulations pertinent to land use that each of these agencies enforce are also described. Other agencies and regulations are described in each topical issue section.

Federal Agencies and Regulations

Environmental Protection Agency (EPA)

EPA implements 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.

Department of Interior

United States Bureau of Land Management (BLM)

The BLM manages approximately 10 million acres of the total 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.

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 (FESA) 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).

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 Army Corps of Engineers (USACE)

Among its responsibilities, the USACE 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 USACE 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.

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.

U.S. Department of Agriculture, 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.

State Agencies and Regulations

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.

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.[5] 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.[6]

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 Department of Forestry and Fire Protection (CDF)

The CDF reviews and approves plans for timber harvesting on private lands. In addition, through its responsibility for fighting wildland fires, the CDF plays a role in planning development in forested areas.

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.

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).

Local Agencies and Regulations

Public Agencies

Public agencies are entrusted with compliance with 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

5 The other federally designated agency is the Bay Conservation and Development Commission (BCDC) which operates outside of the SCAG region.

6 Fulton, W. 1999. *Guide to California planning*. Point Arena, CA: Solano Press Books.

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 CEQA (Public Resource 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 Section 65584(a). SCAG's RHNA provides a tool for providing local affordable housing development strategies.

SCAG's current *Regional Comprehensive Plan and Guide (RCPG) 1996* is intended to provide a permissive framework for decision making by local governments regarding growth and development. The RCPG proposes strategies for local governments to use on a voluntary basis to reconcile local needs with state and federal planning requirements. The Regional Comprehensive Plan is currently undergoing significant revisions.

Local Agency Formation Commissions

The local agency formation commission (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.[7] 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.

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).

7 Governor's Office of Planning and Research. 1997. *LAFCOs, general plans, and city annexations*. Sacramento, CA.

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.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the proposed Plan on existing land uses and existing land use plans and policies.

Comparison with the No Project

The analysis of land use includes a comparison of the expected future conditions with 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 (which is based on a comparison to existing conditions); however, it provides a meaningful perspective on the effects of the2008 RTP.

Determination of Significance

This analysis evaluates land uses most likely to be affected by the construction and operation of the highway, freight rail, and transit projects in the proposed Plan and implementation of transportation and urban form policies and programs included in the Plan. GIS was used to overlay proposed Plan highway, freight rail, and transit alignments and the associated growth projection onto aerial photography of the existing land uses for the SCAG region. In addition to this GIS analysis, land use effects of arterial investments and undefined alignments were also considered. The significance criteria below were applied to determine if resulting changes in land use would be significant. The methodology for determining the significance of these impacts compares the future Plan conditions to the existing setting, as required in *CEQA Guidelines*

Section 15126.2(a). In addition, general plan maps submitted by SCAG member cities and counties were analyzed to evaluate potential conflicts with General Plan land uses.

Significance Criteria

A significant impact is defined as "a substantial or potentially substantial, adverse change in the environment" (Public Resource Code § 21068). The proposed Plan would have a significant impact if implementation would:

- Result in inconsistency with applicable adopted land use plans and policies.
- Divide an established community due to locating transportation facilities near or through an existing community.

Impacts and Mitigation Measures

Implementation of the 2008 RTP would affect land use. Expected significant impacts include inconsistencies with general plans, and cumulatively considerable changes to land use and the intensity of land use, impacts such as loss of prime farmlands, grazing lands, open space and recreation lands are examined in Chapter 3.10 Open Space.

Short-term construction related impacts and long-term or permanent displacement or offsite impacts from new facilities could occur as a result of implementation of the 2008 RTP. Below are descriptions of the types of direct impacts foreseeable from new transportation projects proposed in the 2008 RTP. Indirect impacts due to the changes in population distribution expected to occur due to the 2008 RTP's transportation investments and transportation and land use policies are discussed under cumulative impacts.

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.

Impact 3.8-1: The proposed 2008 RTP contains transportation projects and strategies to distribute the future growth in the region. These projects and strategies could result in inconsistencies with currently applicable adopted local land use plans and policies.

The 2008 RTP contains transportation projects and strategies to help more efficiently distribute population, households, and employment growth in the region. Many of the transportation strategies were developed as a result of SCAG's Compass Blueprint Growth/Vision process. This process involved extensive outreach to and input from local jurisdictions, including, counties, subregions and local city planners. As part of its Regional Housing Needs Assessment (RHNA) completed in June 2007, SCAG developed the integrated growth forecast which established 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.

As a result of this comprehensive and integrated approach, the transportation projects and strategies included in the 2008 RTP are generally consistent with the county and regional level general plan data available to SCAG. However, general plans are updated on an inconsistent basis and not all cities have general plans. Some of the general plans that SCAG relied upon when creating the 2008 RTP are not current and may not reflect current planning policy or practice. In addition, the RTP's 2035 horizon year is beyond the timeline of even the most recent general plans. It is likely that over the period of the 2008 RTP, 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 2008 RTP 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 RTPs.

Mitigation Measures

MM-LU.1: SCAG shall encourage cities and counties in the region to provide SCAG with electronic versions of their most recent general plan and any updates as they are produced.

MM-LU.2: 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-LU.3: 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-LU.4: Planning is an iterative process and SCAG is a consensus building organization. SCAG shall work with cities and counties to encourage that general plans reflect RTP policies. SCAG will work to build consensus on how to address inconsistencies between general plans and RTP policies.

MM-LU.5: SCAG shall provide technical assistance and regional leadership to implement the Compass Blueprint growth strategy and integrate growth and land use planning with the existing and planned transportation network.

MM-LU.6: SCAG shall provide planning services to local governments 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 within 2% Strategy Opportunity Areas
- 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-LU.7: SCAG shall continue with a targeted public relations strategy that emphasizes regional leadership, the benefits and implications of Compass Blueprint principles, and builds a sense of common interests among Southern Californians.

MM-LU.8: SCAG shall expand the role of the Compass Partnership,, a forum for convening representatives from government, civic leaders and members of the development community. SCAG shall encourage cooperative land use decision making and planning efforts between neighboring jurisdictions.

MM-LU.9: 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-LU.10: Local governments should provide for new housing consistent with state housing law to accommodate their share of the forecasted regional growth.

MM-LU.11: Local governments should adopt and implement General Plan Housing Elements that accommodate the housing need identified through the RHNA process. Affordable housing should be provided consistent with the RHNA income category distribution adopted for each jurisdiction.

MM-LU.12: Local governments should consider shared regional priorities, as outlined in the Compass Blueprint, RTP and other ongoing regional planning efforts, in determining their own development goals and drafting local plans.

MM-LU.13: Local governments and subregional organizations should develop ordinance and other programs which will enable and assist in the cleanup and redevelopment of brownfield sites.

MM-LU.14: Local governments and subregional organizations should develop adaptive reuse ordinances and other programs that will enable the conversion of vacant or aging commercial, office and some industrial properties to housing and mixed use housing.

Significance after Mitigation

It is likely that in some instances currently adopted general plans will be inconsistent with RTP policies. This impact would be **significant**.

Impact 3.8-2: The 2008 RTP contains transportation projects that have the potential to disrupt or divide established communities.

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 to 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. Although new transit facilities often create a community benefit by reducing congestion in the area and providing a new mode of travel or reliving overcrowding on an existing modes 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 has the potential to divide a community. As overcrossings and undercrossings 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's GIS was used to analyze where major freeway, rail, and transit projects in the 2008 RTP intersect residential areas. A 150-foot potential impact zone was drawn around the freeway, rail, and transit projects in the 2008 RTP to compute the number of acres potentially affected by the major projects in the 2008 RTP. The analysis shows that approximately 6,500 acres of residential land uses would be located within the 150-foot radius of the freeway, transit, and freight rail projects included in the 2008 RTP.

Additional communities would be affected by the growth associated with the 2008 RTP. The effect of growth and urban development on communities is addressed in the Cumulative Impacts section of this chapter.

The disruption or division of existing communities could be a **significant** impact.

Mitigation Measures

Mitigation measures **MM-LU.1 through MM-LU.14** would be applied to mitigate this impact in addition to the following measures.

MM-LU.15: As part of the second tier review performed on a project-by-project basis, a study shall be completed by the lead agency to determine whether an area is classified as a "cohesive community" as defined by Environmental Handbook Volume 4, Community Impact Assessment (Caltrans 1997). The study should include the method for determining the level of cohesiveness for a given community and identify mitigation measures to reduce or avoid significant effects. Specific mitigation measures could include, but are not limited to pedestrian overcrossings, "cut and covers" and development of parks or other social interaction centers.

MM-LU.16: Significant adverse impacts to community cohesion resulting from the displacement of residences or businesses shall 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-LU.17: Project implementation agencies shall design new transportation facilities that consider access to existing community facilities, as feasible. During the design phase of the project, community amenities and facilities shall be identified and considered in the design of the project.

MM-LU.18: Project implementation agencies shall design roadway improvements that minimize barriers to pedestrians and bicyclists, as feasible. During the design phase, pedestrian and bicycle routes shall be determined that permit connections to nearby community facilities.

Significance after Mitigation

The 2008 RTP 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**.

Cumulative Impact 3.8-3: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to land use and would change the intensity of land use in some areas.

The construction and operation of the transportation projects in the 2008 RTP would affect a number of land uses. **Table 3.8-1,** shows the estimated acreage of different land use categories that occur within 150 feet of either side of the reasonably foreseeable transportation alignments included in the Plan and the No Project Alternative. Under both the Plan and the No Project impacts would occur. In addition to these direct impacts on land use, the total vacant land that is expected to be consumed under the 2008 RTP is estimated to be approximately 200,000 acres compared to approximately 655,000 under the No Project Alternative.

TABLE 3.8-1
LAND USES AFFECTED BY MAJOR HIGHWAY, TRANSIT, AND FREIGHT RAIL PROJECTS IN THE 2008 RTP

Land Use	Plan Alternative Approximate Acres Affected	No Project Alternative (Baseline) Approximate Acres Affected
Commercial	4,600	4,700
Extraction	200	40
Grazing Land	7,000	2,000
Industrial	3,000	1,000
Low Density Residential	500	100
Medium to High Residential	5,700	2,400
Open Space and Recreation	800	300
Prime Farmland	853	400
Public Facilities and Institutions	1,100	1,000
Rural Density Residential	267	40
Transportation and Utilities	10,800	6,700
Vacant	11,700	3,200
Water and Floodways	60	10

SOURCE: SCAG GIS Analysis, 2007 SCAG Land Use, 2005.

The 2008 RTP includes policies that would influence the distribution of the growing population. The land use measures included in the 2008 RTP would encourage use of underutilized 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 the 2008 RTP could result in changes in land uses by changing concentrations of development throughout the six-county region. As such, the

contribution of the 2008 RTP to impacts on existing land use would be cumulatively considerable, as it would result in changes to existing land use, including prime farmlands, grazing lands, and open space and recreational lands.

Mitigation Measures

The mitigation measures listed above for Impacts 3.8-1 and 3.8-2 would be applied as mitigation for this impact. In addition, the following measure would apply.

MM LU-19: SCAG's on-going 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.

Significance after Mitigation

In order to accommodate the projected population totals assumed for 2035, the region will need to change land uses and increase the intensity of some existing land use. The cumulative impact would remain **significant**.

Comparison with the No Project Alternative

Under the No Project Alternative the population of the SCAG region would grow to 24 million people, however no regional transportation investments would be made above the existing programmed projects.

Direct Impacts

The No Project contains fewer transportation investments than the Plan Alternative. 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 Alternative 7,800 acres of business land uses and about 6,500 acres of residential land uses would be affected by transportation projects.

The Plan impacts would be greater than the No Project impacts for Impact 3.8-1 and 3.8-2.

Cumulative Impacts

The No Project Alternative is expected to accommodate the same increase in total population as the proposed Plan, but more projects would be implemented under the 2008 RTP than the No Project. However, the Plan includes land use measures that would help reduce the displacement or disruption of existing communities. These mitigation measures are absent in the No Project Alternative. It is anticipated that the No Project Alternative would consume about 655,000 acres

of vacant, open space and agricultural lands, and that the Plan, despite facilitating increased access to these lands, would control land uses such that only about 200,000 acres of vacant, open space and agricultural lands would be consumed.

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3.9 Noise

This chapter describes noise and noise sources in the SCAG region, identifies potential noise impacts of the RTP, includes mitigation measures for the impacts, and evaluates the residual impacts.

Environmental Setting

Noise Descriptors

Sound waves, traveling outward from a source, exert a sound pressure level (commonly called "sound level"), measured in decibels (dB). "Noise" is often defined as unwanted sound, and environmental noise is usually measured in "A-weighted" decibels, which is a decibel corrected for the variation in frequency response of the typical human ear at commonly-encountered noise levels. All noise levels discussed herein reflect A-weighted decibels. In general, people can perceive a two- to three-dB difference in noise levels; a difference of 10 dB is perceived as a doubling of loudness.

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 (Leq), Day-Night Average Noise Level (DNL), and Community Noise Equivalent Level (CNEL). The Leq 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 Leq 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.). Cumulative noise descriptors, DNL and CNEL, are well correlated with public annoyance due to transportation noise sources. **Table 3.9-1** shows the compatibility between various land uses and CNEL.

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 5 to 10 dB higher than the Lmax.

TABLE 3.9-1
NOISE LAND USE COMPATIBILITY MATRIX

Land Use	Annual Community Noise Equivalent Level (CNEL) in Decibels				
	55	60	65	70	75
Outdoor Amphitheatres					
Nature preserves, wildlife preserves, livestock farming; neighborhood and playgrounds					
Schools, preschools, libraries		45			
Residential- single family and multiple family, mobile homes, residential hotels, retirement homes, intermediate care facilities, hospitals, nursing homes		45			
Hotels and motels, other transient lodging; auditoriums, concert halls, indoor arenas, churches		45	45		
Office buildings- business, educational, professional and personal services; R&D offices and laboratories			50		
Riding stables, water recreation facilities, regional parks and athletic fields, cemeteries; outdoor spectator sports, golf courses					
Commercial- retail; shopping centers, restaurants, movie theatres			50	50	
Commercial- wholesale; industrial; manufacturing					
Agriculture (except residences and livestock), extractive industry, fishing, utilities, and public R-O-W					

	Compatible: The outdoor community noise equivalent level is sufficiently attenuated by conventional construction that the indoor noise level is acceptable, and both indoor and outdoor activities associated with the land use may be carried out.
45	**Conditionally Compatible:** The outdoor community noise equivalent level will be attenuated to the indoor level shown, and the outdoor noise level is acceptable for associated outdoor activities.
	Incompatible: The community noise equivalent level is severe. Although extensive mitigation techniques could make the indoor environment acceptable for performance of activities the outdoor environment would be intolerable for outdoor activities associated with the land use.

Vibration Measuring and Reporting

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. Several different methods 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. 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. The decibel notation, VdB, is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration.[1]

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 may affect concentration or disturb sleep. In addition, high levels of groundborne vibration may damage fragile buildings or interfere with equipment that is highly sensitive to groundborne vibration (e.g., electron microscopes). To counter the effects of groundborne vibration, the Federal Railway Administration (FRA) and the Federal Transmit Administration (FTA) have published guidance relative to vibration impacts. According to FRA, fragile buildings can be exposed to groundborne vibration levels of 0.5 PPV without experiencing structural damage.[2] The FTA has identified the human annoyance response to vibration levels as 80 VdB.[3]

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 VdB or lower, well below the threshold of perception for humans, which is around 65 VdB.4 Most perceptible 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.

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.

1 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, April 1995.

2 Federal Railway Administration, High-Speed Ground Transportation Noise and Vibration Impact Assessment, December 1998.

3 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, April 1995.

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[4]. 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.

Noise Sources

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 AFB), March Inland Port (joint use with March Air Reserve Base), Southern California Logistics Airport (formerly George AFB) and Palmdale Airport (joint use with Air Force Plant 42).

Freeways and Arterial Roadways

The region has over 20,717 centerline (route) miles and over 64,771 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.

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.[5]

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4 United States Environmental Protection Agency. July 1981. Noise effects handbook (pp.8-2). Washington, DC: Author.

5 Beranek, L. L. 1988. *Noise and vibration control* (pp. 182). New York: McGraw-Hill.

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.[6]

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 as well.[7] In addition, use of air horns and crossing bell gates contribute to noise levels in the vicinity of grade crossings. **Table 3.9-2**: provides reference noise levels in terms of Sound Exposure Levels (SEL) for different types of rail operations.

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.[8] In addition to noise, freight trains also generate substantial amounts 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.

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6 *Ibid*.

7 Wyle Laboratories. July 1973. Assessment of noise environments around railroad operations (Research Report No.
WCR 73-5 El Segundo, CA: Author.

8 "Class I" railroads have annual gross revenues of $250 million or more.

TABLE 3.9-2
REFERENCE NOISE LEVELS FOR VARIOUS RAIL OPERATIONS

Source/Type		Reference Conditions	Reference Noise Level (SEL)*
Commuter Rail, At-Grade	Locomotives	Diesel-Electric, 3,000 horsepower, throttle 5	92
		Electric	90
	Cars	Ballast, welded rail	82
Rail Transit		At-grade, ballast, welded rail	82
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

Notes: *Measured at 50 feet from track centerline with trains operating at 50 miles per hour. For the sake of comparison, an automobile passby event generates approximately SEL 73 dB, and a city bus generates approximately SEL 84 dB. SEL = Sound Exposure Level

SOURCE: United States Department of Transportation, Federal Aviation Administration. (1995, April). *Transit Noise and Vibration Impact Assessment*. Washington, DC: Author.

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).[9] 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[10]; 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.

9 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.

10 County of Ventura. May 1988. *Ventura county general plan, hazards appendix*. Ventura, CA: Author.

The Southern California Regional Rail Authority operates the Metrolink commuter rail system. This system currently includes seven rail lines, 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 traverses 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 State Route 91 that allow vehicles to pass above the trains. North of State Route 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 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).[11]

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 3.9-3** 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.[12]

TABLE 3.9-3
DEMOLITION AND CONSTRUCTION EQUIPMENT SOURCE NOISE LEVELS

Equipment Type	Typical Equipment dB Level	Quieted Equipment dB Level*
Air Compressor	81	71
Backhoe	85	80
Concrete Pump	82	80
Concrete Vibrator	76	70
Concrete Breaker	82	75
Truck Crane	88	80
Dozer	87	83
Generator	78	71
Loader	84	80
Paver	88	80
Pneumatic Tools	85	75
Water Pump	76	71
Power Hand Saw	78	70
Shovel	82	80
Trucks	88	83
Pile Drivers	90	80

Notes: Noise levels for typical and quieted equipment at 50 feet from source. *Quieted equipment can be designed with enclosures, mufflers, or noise-reducing features.
SOURCE: United States Environmental Protection Agency. (1971). *Noise from construction equipment and operations, building equipment and home appliances*. Washington, DC: U.S. Government Printing Office.

11 *Ibid.*

12 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.

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. As shown in **Table 3.9-2** 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.

Existing Vibration Sources

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.

Regulatory Setting

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 Agencies and Regulations

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."

Under the regulations, a "substantial increase" is defined as an increase in Leq of 12 dB during the peak hour of traffic noise. For sensitive uses, such as residences, schools, churches, parks, and playgrounds, the Noise Abatement Criteria for interior and exterior spaces is Leq 57 and 66 dB, respectively, during the peak hour of traffic noise.

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.

Federal Vibration Policies. The Federal Railway Administration (FRA) and the Federal Transit Administration (FTA) have published guidance relative to vibration impacts. According to the FRA, fragile buildings can be exposed to groundborne vibration levels of 0.5 PPV without experiencing structural damage.[13] The FTA has identified the human annoyance response to vibration levels as 80 VdB.[14]

State Agencies and Regulations

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.

13 Federal Railway Administration, *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, December 1998.
14 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, April 1995.

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.

California Noise Insulation Standards

The California Noise Insulation Standards found in the *California Code of Regulations*, Title 24, 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.

State Vibration Policies.

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 Agencies and Regulations

To identify, appraise, and remedy noise problems in local communities, each county and city in the SCAG region has adopted 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.

Methodology

This section summarized the methodology used to evaluate the expected noise impacts from implementing the 2008 RTP.

Comparison with the No Project

The analysis of noise impacts 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 to existing conditions); however, it provides a meaningful perspective on the effects of the 2008 RTP.

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.), and
- location of the roadway with respect to sensitive receptors.

Noise from highway traffic is generally measured in terms of one-hour equivalent steady-state sound levels that contain the same acoustic energy as a time-varying sound level (Leq1h). Following FHWA guidance, noise impacts occur when predicted noise levels increase substantially when compared to existing levels, or when noise levels approach or exceed the FHWA's noise abatement criteria (NAC).

To evaluate the alternatives, the existing condition was compared with the future 2035 alternatives. The comparisons were accomplished using GIS by "overlaying" the network traffic results for the existing condition, with results for the Plan and identifying the following:

- roadways proposed to be on a new alignment , and,
- roadways where it is anticipated that noise levels would increase 3 dBA or more above existing levels.

Roadways anticipated to have an increase of 3 dBA from existing conditions are roadways where:

- the total traffic volume increases 100 percent from existing conditions,

- the truck (medium and heavy) volume increases by 130 percent from existing conditions, or
- the truck (medium and heavy) volume increases by 100 percent with an increase in other vehicles of 50 percent.

It was also determined that the evaluation should consider the potential for absolute noise impacts. Following guidance published by Caltrans, a noise impact is determined to occur if predicted noise levels approach the NAC for land use (activity category) "B" by 1 dBA (66 dBA).

The FHWA's Traffic Noise Model (TNM) Version 2.5 was used in the highway noise analysis to identify total vehicle volumes, the number of trucks, and speeds necessary to generate a sound level of 66 dBA at a location 50 feet from the edge of pavement. The analysis was preformed for a number of differing volumes, vehicle mixes and speeds as each independently contributes to the level of sound generated on roadways. This assessment was conducted independently for freeways and arterial/collector roadways in order to accurately account for the differences in roadway pavement widths.

Using a Geographic Information System (GIS) platform, the roadway segments for Plan and No Project were sorted by total vehicles, total trucks, and speeds. The roadway segments within the 6-county region for each scenario were then assessed against the total volumes, mixes and speeds calculated by the TNM to identify those segments that met or exceeded 66 dBA.

Using the criteria described above, the total miles of potentially affected roadways (arterials and interstates) were identified for the Plan and no Project Alternative compared to today.

Significance Criteria

A significant impact is defined as "a substantial or potentially substantial, adverse change in the environment" (*CEQA Guidelines* § 21068). The proposed Plan would have a significant noise impact if implementation would potentially result in:

- Noise levels, groundborne noise levels and excessive groundborne vibration that increase substantially and temporarily adjacent to transportation facility construction.
- Noise levels, groundborne noise levels and excessive groundborne vibration that increase substantially and permanently adjacent to transportation facilities.
- Noise levels that increase substantially and permanently adjacent to sensitive receptors.
- A cumulatively considerable increase in regional ambient noise levels.

Impacts and Mitigation Measures

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.

Impact 3.9-1: Grading and construction activities associated with the proposed freeway, arterial, transit and HSRT projects identified in the 2008 RTP would intermittently and temporarily generate noise levels above ambient background levels. Noise levels in the immediate vicinity of the construction sites would increase substantially sometimes for extended duration.

Freeway and arterial projects proposed in the 2008 RTP 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.

Construction activities associated with the proposed Plan would result in temporary noise increases at nearby sensitive receptors. **Table 3.9-4:** 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. Impacts to sensitive receptors resulting from these proposed projects would depend on several factors, such as the type of project proposed for the given area, land use of the given area, and duration of proposed construction activities. Additionally, 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. .Sensitive receptors could be affected by projects involving the construction of new systems (new facilities, capacity enhancement facilities, rail corridors, interchanges, underground rail lines), located within the vicinity of the receptor. Generally, construction related noise impacts would be short term and localized in nature. Nonetheless, construction of projects in the 2008 RTP would result in a substantial increase in short term noise, thus this impact would be **significant**.

Mitigation Measures

MM-NO.1: Project implementing agencies shall comply with all local sound control and noise level rules, regulations, and ordinances.

MM-NO.2: Project implementing agencies shall limit the hours of construction to between 6:00 a.m. and 8:00 p.m. on Monday through Friday and between 7:00 a.m. and 8:00 p.m. on Saturdays. Construction should not occur on Sundays or Holidays within 3,000 feet of sensitive receptors without specific overriding need being documented.

MM-NO.3: Equipment and trucks used for project construction shall utilize the best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) in order to minimize construction noise impacts.

TABLE 3.9-4
TYPES AND DURATION OF NOISE PRODUCED BY PROPOSED PROJECTS

PROJECT TYPE	Noise Levels			Duration		
	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.

MM-NO.4: Impact equipment (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered wherever possible, to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed air exhaust would 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 where feasible, and this could achieve a reduction

of 5 dBA. Quieter procedures will be used, such as the use of drilling rather than impact equipment, whenever feasible.

MM-NO.5: Project implementing agencies shall ensure that stationary noise sources are located as far from sensitive receptors as possible. If they must be located near existing receptors, they shall be adequately muffled.

MM-NO.6: The project implementing agencies shall designate a complaint coordinator responsible for responding to noise complaints received during the construction phase. The name and phone number of the complaint coordinator shall be conspicuously posted at construction areas and on all advanced notifications. This person shall be responsible for taking steps required to resolve complaints, including periodic noise monitoring, if necessary.

MM-NO.7: Noise generated from any rock-crushing or screening operations performed within 3,000 feet of any occupied residence shall be mitigated by the project proponent by strategic placement of material stockpiles between the operation and the affected dwelling or by other means approved by the local jurisdiction.

MM-NO.8: Project implementing agencies shall direct contractors to implement appropriate additional noise mitigation measures including, but not limited to, changing the location of stationary construction equipment, shutting off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources to comply with local noise control requirements.

MM-NO.9: Project implementing agencies shall 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-NO.10: In residential areas, pile driving will be limited to daytime working hours. No pile-driving or blasting operations shall be performed within 3,000 feet of an occupied residence on Sundays, legal holidays, or between the hours of 8:00 p.m. and 8:00 a.m. on other days. Any variance from this condition shall be approved by the local jurisdiction only with documentation of overriding need.

MM-NO.11: Wherever possible, sonic or vibratory pile drivers will be used instead of impact pile-drivers (sonic pile drivers are only effective in some soils). If sonic or vibratory pile drivers are not feasible, acoustical enclosures will be provided as necessary to ensure that pile driving noise does not exceed speech interference criterion at the closest sensitive receptor.

MM-NO.12: Engine and pneumatic exhaust controls on pile drivers will be required as necessary to ensure that exhaust noise from pile driver engines is minimized to the extent feasible.

MM-NO.13: Where feasible, pile holes will be pre-drilled to reduce potential noise and vibration impacts.

Significance after Mitigation

The above mitigation measures would reduce noise impacts; however, it is anticipated that construction noise would remain a **significant** impact.

Impact 3.9-2: Noise-sensitive land uses could be exposed to noise in excess of normally acceptable noise levels and/or could experience substantial increases in noise 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 transit facilities as well as increased use of existing transit facilities, etc.).

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. **Table 3.9-5** shows existing hospitals schools, nursing homes and senior centers that would be within 0.25 miles of RTP and No Project Alternative projects. **Table 3.9.6** lists proposed new and expanded facilities with potential noise impacts, including highway, freeway, rail transit, tollway, truck-climbing lanes, freeway interchanges, and HSRT projects. Arterials, transportation demand management projects, operations and maintenance projects, grade crossings, ramp and interchange improvements, county-wide bus route expansions, and transit facility improvements are not specifically considered here because noise impacts already occur in the vicinity of these facilities, and determining increases in noise requires greater precision of information.

It should be noted that the list of projects identified in the following table are indicative of projects most likely to generate potentially significant noise impacts due to facility operation, but the list is neither exhaustive nor definitive. Each of the projects included in the 2008 RTP would need to be evaluated independently as part of its own environmental assessment and review process.

Freeways

Table 3.9-7 shows the percentage of freeways and arterials in each county and in the region that would experience noise levels exceeding 66 dBA, which is the Caltrans noise abatement criterion for noise sensitive land uses for existing conditions, the Plan, and the No Project Alternative. As indicated in table 3.9-6 most freeways (97 percent in the region) will experience noise levels exceeding 66 dBA.

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 Plan.

The evaluation did not take into account whether there are sensitive receptors located adjacent to the freeways and arterials, but evaluates all roadways equally, regardless of whether sensitive land uses are adjacent.

Transit

The 2008 RTP includes projects for rail transit and Metrolink. It is anticipated that any noise sensitive land uses located immediately adjacent to these lines would be significantly impacted. The existing urban rail and Metrolink system would experience increased use. Sensitive uses located along existing lines would be further exposed to noise associated with increased rail and light rail activities.

High Speed Regional Transport (HSRT)

In addition, the Plan includes 269 centerline miles of HSRT for passenger and freight, although several lines or segments would be built along existing right-of-way, the addition of HSRT to existing transportation infrastructure could result in a significant increase in noise levels.

As shown in **Table 3.9-5**, it is anticipated that at a minimum the following sensitive receptors would be within 0.25 miles of RTP and No Project Alternative projects and could be impacted by projects in the No project condition and 2008 RTP. Because the projects included within the No Project Alternative would occur with or without the Plan, total number of sensitive receptors affected under 2035 with the Plan would be a combination of both columns in the chart below:

TABLE 3.9-5
SENSITIVE RECEPTORS WITHIN 0.25 MILES OF 2008 RTP PROJECTS AND NO PROJECT ALTERNATIVE PROJECTS

Sensitive Receptor	No Project	2008 RTP Plan
Colleges	19	4
Hospitals	8	8
Public Elementary Schools	17	14
Public Middle Schools	4	3
Public High Schools	11	5
Nursing Homes	26	14
Senior Centers	5	4
Private/religious Schools	58	17

Source: Southern California Association of Governments (2007)

Mitigation Measures

MM-NO.14: As part of the appropriate environmental review of each project, a project specific noise evaluation shall be conducted and appropriate mitigation identified and implemented.

TABLE 3.9-6
DRAFT 2008 RTP PROJECTS WITH POTENTIAL NOISE IMPACTS

CO	Route/Program	From	To	Description
IM	JASPER RD.	SR-111	SR-7	WIDEN FROM 2 TO 6 LANES (3 EACH DIR) LIMITED ACCESS EXPRESSWAY
IM	SR-115	I-8	EVAN HEWES HWY	CONSTRUCT 4-LANE LIMITED ACCESS EXPRESSWAY
IM	I-8	DOGWOOD RD		ON I-8 AT DOGWOOD RD, CONSTRUCT FULL INTERCHANGE - WIDEN DOGWOOD FROM 2 TO 4 LANES (2 EACH DIR) OVER I-8
IM	SR-186/I-8			IMPROVE INTERCHANGE - ON SR-186 ADD 1 LANE EACH DIR BETWEEN RAMPS, AND WIDEN RAMPS
IM	SR-111	SR-98	I-8	UPGRADE TO FREEWAY (3 LANES EACH DIR) INCL. INTERCHANGES AT MCCABE, JASPER, HEBER, AND OVERCROSSING AT CHICK RD
LA	I-5	ROUTE 19	I-710	RTE 5 HOV LNS FROM RTE 19 TO RTE 710 - ADD ONE LANE IN EACH DIRECTION
LA	SR-14	AVE. P-8	AVE. L	ADD 1 HOV LANE EACH DIRECTION ON THE SR-14 FROM AVE. P-8 TO AVE. L
LA	I-5/I-405	SOUTH	NORTH	I-5/I-405 CARPOOL LANE PARTIAL CONNECTOR (SOUTH TO NORTH)
LA	PIER B ST/TERMINAL ISLAND FWY			INTERCHANGE IMPROVEMENT - NEW NB ON-RAMP TO SR-103
LA	SR-57/SR-60			SR-57/SR-60 INTERCHANGE IMPROVEMENT
LA	PORTS OF LOS ANGELES/LONG BEACH			NEW CERRITOS CHANNEL RAIL BRIDGE
LA	PORTS OF LOS ANGELES/LONG BEACH			TRIPLE TRACK S/O THENARD
LA	METRO RAIL GOLD LINE EXTENSION	AZUSA-CITRUS	MONTCLAIR	METRO RAIL GOLD LINE EXTENSION-SEGMENT 2 AZUSA-CITRUS TO MONTCLAIR STATION LRT EXTENSION.
LA	METRO RAIL GREEN LINE EXTENSION	MARIPOSA & NASH	CENTURY & SEPULVEDA-LAX TERMINAL	PEOPLE MOVER OR LIGHT RAIL
OR	M1 ROADWAY PROJECTS	COUNTYWIDE		COMPLETION OF MEASURE M ROADWAY PROJECTS
OR	REGIONAL CAPACITY PROGRAM	COUNTYWIDE		COMPLETE MPAH, IMPROVE ARTERIAL CAPACITY
OR	I-5 SB	LA PAZ ROAD	OSO PARKWAY	EXTEND AUXILIARY LANE THROUGH INTERCHANGE
OR	I-5 SB	ALICIA PARKWAY	LA PAZ ROAD	EXTEND AUXILIARY LANE THROUGH INTERCHANGE
OR	SR-55 NB	DYER	EDINGER	ADD AUXILIARY LANE

TABLE 3.9-6 (Continued)
DRAFT 2008 RTP PROJECTS WITH POTENTIAL NOISE IMPACTS

CO	Route/Program	From	To	Description
OR	SR-91 WB	NB SR-55	WB SR-91 AT TUSTIN	ADD 1 AUX LANE WESTBOUND
OR	I-405 SB	SR-133	IRVINE CENTER DRVE	ADD 2ND AUXILIARY LANE
OR	I-405 NB	JEFFREY	CULVER	ADD AUXILIARY LANE
OR	I-405	EUCLID	MAGNOLIA	ADD AUXILIARY LANE EACH DIRECTION AND REPLACE BRIDGES
OR	I-405 NB	SR-133	JEFFREY	ADD AUXILIARY LANE
OR	I-5	COAST HIGHWAY	PICO	ADD 1 HOV LANE EACH DIRECTION
OR	I-5	SR-55	SR-57	ADD 1 HOV LANE EACH DIRECTION
OR	SR-57	CERRITOS		HOV DROP RAMP
OR	SR-73	I-405		HOV CONNECTOR
OR	SR-73	I-405	MACARTHUR	ADD 1 HOV LANE EACH DIRECTION
OR	I-405	AT VON KARMAN		HOV DROP RAMP
OR	I-405	BEAR		HOV DROP RAMP
OR	I-5	AVERY PARKWAY		AVERY PARKWAY RAMP RELOCATION, RECONFIGURATION, UPGRADES
OR	I-5	STONEHILL DR		ADD SOUTHBOUND I-5 OFF-RAMP AT STONEHILL
OR	I-5	EL TORO ROAD (LOS ALISOS)		ADD RAMPS AT LOS ALISOS OR AVE. DE LA CARLOTA
OR	I-5	MARGUERITE PARKWAY		ADD NEW INTERCHANGE AT MARGUERITE PARKWAY (SADDLEBACK CC CONNECTION)
OR	I-405 SB/SR-55 NB	SOUTH BRISTOL BRAID		DELETE LEFT TURN ACCESS FROM NB BRISTOL TO SB I-405. PROVIDE RIGHT TURN ON-RAMP FROM NB BRISTOL TO SB I-405 VIA A NEW BRAID THAT ALSO PROVIDES DIRECT ACCESS TO NB SR-55.
OR	SR-57 SB	SR-90		ADD DECELERATION LANE
OR	SR-73	GLENWOOD DRIVE		COMPLETE GLENWOOD INTERCHANGE TO/FROM SOUTH
OR	SR-91	LAKEVIEW INTERCHANGE		CONSTRUCT BARRIER-SEPARATED ON-RAMP (2 LANES) FROM SB LAKEVIEW TO WB SR-91
OR	I-5	SR-133	SR-55	ADD 1 MF LANE EACH DIRECTION
OR	I-5	SR-57	SR-91	ADD 1 LANE EACH DIRECTION
OR	I-5	SR-73	EL TORO RD	ADD 1 MF LANE EACH DIRECTION
OR	SR-55	I-405	I-5	ADD 1 LANE EACH DIRECTION, FIX CHOKEPOINTS

TABLE 3.9-6 (Continued)
DRAFT 2008 RTP PROJECTS WITH POTENTIAL NOISE IMPACTS

CO	Route/Program	From	To	Description
OR	SR-55	SR-22	I-5	ADD MF LANE IN EACH DIRECTION
OR	SR-91 EB	SR-57	SR-55	ADD 1 MF LANE
OR	SR-91	SR-241	I-15	IN ORANGE COUNTY, ADD A WB MF LANE FROM 241 OFF RAMP TO GYPSUM CANYON AND AUX LANES EACH DIRECTION BETWEEN 241 AND COUNTY LINE. SEE RIVERSIDE COUNTY FOR ADDITIONAL IMPROVEMENTS.
OR	I-405	I-5	SR-55	ADD 1 MF LANE EACH DIRECTION
OR	SR-91	FAIRMONT DRVE		CONSTRUCT NEW PARTIAL OVERCROSSING AT FAIRMONT BLVD TO PROVIDE NORTHERLY ACCESS FOR YORBA LINDA TO/FROM SR-91 EXPRESS LANES; DROP RAMPS ON EAST SIDE OF OVERCROSSING, TO EB AND FROM WB EXPRESS LANES
OR	METROLINK COMMUTER RAIL	COUNTYWIDE		HIGH-FREQUENCY SERVICE TO LA & RIVERSIDE AND CORRIDOR IMPROVEMENTS
OR	SR-57 NB	LAMBERT	TONNER CANYON ROAD	TRUCK CLIMBING LANE
OR	I-405 NB	LAKE FOREST DRIVE	IRVINE CENTER DRVE	ADD 2ND NB TRUCK LANE
RI	SR-79	DOMENIGONI PKWY	GILMAN SPRINGS RD.	REALIGNMENT/WIDENING 4 TO 6 LANES
RI	SR-79	HUNTER RD	DOMENIGONI PKWY	WIDEN FROM 4 TO 6 LANES
RI	I-10	CALIMESA @ COUNTY LINE RD	500 METERS E/O SANDLWOOD DR I/C	REPLACE BRIDGE, RAMPS, CONSTRUCT AUXILIARY LANES, AND REALIGN CALIMESA RD
RI	I-15	SR79 SOUTH	SR79 NORTH	ADD 1 AUXILIARY LANE IN BOTH DIRECTIONS
RI	I-15	SR-60	SAN BERNARDINO COUNTY LINE	ALSO SBD-15-0.0/2.39 ROUTE 60 TO I-10 ADD & EXTEND AUX LANES
RI	SR-60	0.4 MI E/O I-15/SR-60 IC	0.2 MI E/O MAIN ST	ADD AUXILIARY LANES BOTH DIRECTIONS
RI	I-15	I-215/I-15 JCT	SR74	BUILD 2 HOV LANES (1 LANE IN EACH DIRECTION)
RI	I-215	NUEVO RD	BOX SPRINGS RD	ADD 1 HOV LANE IN EACH DIRECTION
RI	NEW INTERCHANGE LANDAU AND I-10	AVENIDA	VARNER ROAD	CONSTRUCT NEW 6-LANE MIXED FLOW, PARTIAL CLOVERLEAF IC WITH AUXILIARY LANES AND 4 TWO LANE RAMPS PLUS 6 LANE GRADE SEPARATION BRIDGE OVER UPRR BETWEEN PALM DR IC AND DATE PALM DRIVE IC
RI	I-10	AT HIGHLAND SPRINGS AVE	BTWN 5TH ST AND SOUTH RAMPS	RECONSTRUCT/WIDEN IC FROM 4 TO 6 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	I-10	AT SUNSET AVE	BTWN RAMPS	RECONSTRUCT/WIDEN IC FROM 2 TO 4 LANES AND RECONSTRUCT/WIDEN RAMPS

TABLE 3.9-6 (Continued)
DRAFT 2008 RTP PROJECTS WITH POTENTIAL NOISE IMPACTS

CO	Route/Program	From	To	Description
RI	I-10	AT AVE 50	I-10	CONSTRUCT NEW 4 LANE IC AND RAMPS
RI	I-10	AT SR-79/ BEAUMONT AVE	BTWN 6TH ST & 1ST ST	RECONSTRUCT/WIDEN IC FROM 4 TO 6 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	I-10	AT 8TH ST	BTWN RAMSEY ST & LINCOLN ST	RECONSTRUCT/WIDEN IC UC 2 TO 4 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	I-10	IN CABAZON (R18.9) (FROM APPROX SEMINOLE DR N/O I-10)	AT MAIN STREET IC (19.9) (TO APPROX BONITA AVE S/O I-10)	IMPROVE INTERCHANGE - WIDEN 3 TO 6 LANES & CONSTRUCT RR GRADE SEPARATION CROSSING
RI	I-10	AT COUNTY LINE RD	BTWN 7TH ST & I-10 EAST RAMPS	RECONSTRUCT/WIDEN IC FROM 2 TO 4 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	I-10	AT DILLON RD	BTWN VISTA DEL NORTE AND VISTA DEL SUR	RECONSTRUCT/WIDEN IC FROM 2 TO 4 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	I-10	AT FUTURE DA VALL DR AT I-10 SOUTH OF VARNER ROAD	DA VALL ROAD SOUTH OF UPRR	CONSTRUCT NEW 6-LANE MIXED FLOW, PARTIAL CLOVERLEAF IC WITH AUXILIARY LANES AND 4 TWO LANE RAMPS PLUS 6 LANE GRADE SEPARATION BRIDGE OVER UPRR BETWEEN RAMON ROAD IC AND DATE PALM DRIVE IC
RI	I-10/SR-60 JCT/SPLIT	SR60/I-10 JCT/SPLIT		CONSTRUCT NEW INTERCHANGE
RI	I-15	AT NICHOLS RD	BTWN RAMPS	RECONSTRUCT/WIDEN IC FROM 2 TO 6 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	I-15	AT OLIVE ST	BTWN ORCHARD ST AND GRAPE ST	CONSTRUCT NEW 4 LANE IC AND RAMPS
RI	I-15	AT MALAGA RD	BTWN CASINO DR LAKEVIEW TERRACE AND GRAPE ST	CONSTRUCT NEW 4 LANE OC OVER I-15
RI	I-15	AT SECOND ST (CHANEY AVE)	BTWN COLLIER AVE AND CAMINO DEL NORTE	CONSTRUCT NEW 4 LANE ARTERIAL CONNECTING OVERCROSS OVER I-15
RI	I-15	AT RIVERSIDE DR	BTWN COLLIER AVE AND DEXTER AVE	CONSTRUCT NEW 4 LANE OC OVER I-15
RI	I-15	AT LEMON ST UC	BTWN ALMOND ST AND GRAPE ST	WIDEN UC FROM 2 TO 4 LANES
RI	I-15	AT BELLEGRAVE AVE	BTWN HAMNER AVE & WINEVILLE RD	ADD SIGNALS AND RAMPS. 0.1 MI.
RI	I-15	AT LAKE ST	BTWN WALKER CYN RD TEMESCAL CYN RD	RECONSTRUCT/WIDEN IC FROM 2 TO 6 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	I-15	AT 2ND ST	BTWN HAMNER AVE & VALLEY VIEW AVE	RECONSTRUCT/WIDEN IC FROM 2 TO 4 LANES AND WIDEN RAMPS

TABLE 3.9-6 (Continued)
DRAFT 2008 RTP PROJECTS WITH POTENTIAL NOISE IMPACTS

CO	Route/Program	From	To	Description
RI	I-15	AT 6TH ST	BTWN HAMNER AVE & SIERRA AVE	RECONSTRUCT INTERCHANGE/RAMPS/CHANNELIZATION IMPROVEMENTS
RI	I-15	AT I-15/RANCHO CALIFORNIA	BTWN YNEZ RD AND JEFFERSON AVE	RECONFIGURE 4 TO 6 LANE IC AND RAMPS AT I-15. TYPE OF LANES FOR ARTERIAL WIDENING WILL BE THROUGH LANES
RI	I-15	AT FRANKLIN	BTWN MAIN ST AND RR	CONSTRUCT NEW 4 LANE IC AND RAMPS
RI	I-15	AT BUNDY CANYON RD	BTWN ORANGE ST & CHERRY ST	RECONSTRUCT/WIDEN IC FROM 2 TO 4 LANES AND RECONSTRUCT RAMPS
RI	I-15	AT TEMESCAL CANYON	NEAR INDIAN TRUCK TRAIL AND GLENN IVY JUST BEYOND AND BTWN RAMPS	RECONSTRUCT/WIDEN IC FROM 2 TO 4 LANES AND RECONSTRUCT RAMPS
RI	I-15	AT HORSETHIEF CANYON RD	JUST BEYOND AND BTWN RAMPS	RECONSTRUCT/WIDEN IC FROM 2 TO 4 LANES AND RECONSTRUCT RAMPS
RI	SR-60	AT REDLANDS BLVD	BTWN HEMLOCK AVE & FIR AVE	WIDEN ARTERIAL FROM 2 TO 4 THROUGH LANES. RECONSTRUCT TO TYPE L-9/EB OFF - 3 LANES, EB ON - 2 LANES, WB OFF - 2 LANES, WB ON - 2 LANES
RI	SR-60	AT PERRIS BLVD	BTWN SUNNYMEAD BLVD & IRONWOOD	RECONSTRUCT/WIDEN ARTERIAL FROM 4 TO 6 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	SR-60	AT GILMAN SPRINGS ROAD	BTWN N/B & S/B ON/OFF RAMPS	WIDEN ARTERIAL FROM 2 THROUGH LANES TO 6 THROUGH LANES. RECONSTRUCT/WIDEN TO EB OFF - 2 LANES, EB ON - 1 LANE, WB OFF - 1 LANE, WB ON - 2 LANES/WIDEN RAMPS
RI	SANDERSON AVE (SR-79)	AT RAMONA EXPRESSWAY (SR-79)	BTWN N.RAMONA BLVD AND RAMONA EXP.	CONSTRUCT NEW 6 LANE I/C AND RAMPS
RI	SR-79 (HEMET BYPASS)	AT SR-74 (FLORIDA AVE)	WEST OF HEMET (BETWEEN WARREN AVE AND 1/2 MILE WEST OF SR79/SR74 INTERSECTION)	CONSTRUCT NEW 6 LANE I/C AND RAMPS
RI	SR86S	AT SR195 (AVE 66) NEAR MECCA	BTWN PIERCE ST AND LINCOLN ST	CONSTRUCT NEW 4 LANE IC AND RAMPS
RI	SR-86	AT AVE 54	BTWN SR-111 & FILLMORE	CONSTRUCT 4 LANE BRIDGE/INTERCHANGE AND RAMPS ACROSS SR-86
RI	SR-86S	NEAR COACHELLA, SR-86S	AT AVE. 62	CONSTRUCT A 4 LANE SPREAD DIAMOND IC W/ 4 RAMPS 2 LANE ENTRANCE RAMPS AND 1 LANE EXIT RAMPS
RI	SR86S	AT DILLON RD	BTWN WEST OF COACHELLA STORM WATER CHANNEL AND AVENUE 47	RECONSTRUCT/WIDEN IC FROM 2 TO 4 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	SR86S	AT AVENUE 52	BTWN COACHELLA STORM WATER CHANNEL AND POLK ST	CONSTRUCT IC AND WIDEN FROM 2 TO 6 LANES AND CONSTRUCT RAMPS

TABLE 3.9-6 (Continued)
DRAFT 2008 RTP PROJECTS WITH POTENTIAL NOISE IMPACTS

CO	Route/Program	From	To	Description
RI	SR-91	AT ARLINGTON AVE	BTWN MT DIABLO TO S/O EASTBOUND ENTRY RAMPS	RECONSTRUCT/WIDEN IC FROM 4 TO 6 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	SR-91	AT CENTRAL AVE	BTWN NEVA PL AND BNSF RR	RECONSTRUCT/WIDEN IC FROM 4 TO 6 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	SR91/I-15	SR91/I-15 JUNCTION	SR91/I-15 JUNCTION	BUILD CONNECTOR IMPROVEMENTS AND COLLECTOR DISTRIBUTION SYSTEM AT I-15
RI	I-215	AT GARBANI RD	BTWN HAUN RD & ANTELOPE RD	CONSTRUCT NEW 4 LANE (2 LNS EAC DIR) AND RAMPS
RI	I-215	AT OLEANDER AVE	BTWN HARVILL AVE AND WESTERN WAY	RECONSTRUCT AND WIDEN OC FROM 2 TO 4 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	I-215	AT ELLIS AVE	BTWN PERRIS VALLEY STORM DRAIN W/O I-215 TO DUNLAP DR E/O I-215	CONSTRUCT NEW 2 LANE IC AND RAMPS (1 LANE)
RI	I-215	AT RAMONA EXPWY	BTWN RAMPS	RECONSTRUCT/WIDEN FROM 4 TO 8 LANES, WIDEN SB AND NB EXIT RAMPS AT I-214/RAMONA EXPWY IC AND OC, CONSTRUCT DUAL LEFT-TURN LANES AT THE EXIT RAMPS TEMINI
RI	I-215	AT MCCALL BLVD	BTWN BRADLEY RD & ENCANTO DR	RECONSTRUCT/WIDEN IC FROM 4 TO 6 LANES AND RECONSTRUCT RAMPS
RI	I-215	AT ALESSANDRO BLVD	BTWN BNSF & OLD 215 FRONTAGE ROAD	WIDEN/RECONSTRUCT IC FROM 4 TO 6 LANES AND RECONSTRUCT/WIDEN RAMPS
RI	I-215	AT MID-COUNTY PARKWAY	BTWN RAMPS	CONSTRUCT NEW 6 LANE IC AND RAMPS
RI	CETAP - MORENO VALLEY TO SAN BERNARDINO COUNTY	MORENO VALLEY	SAN BERNARDINO COUNTY	CONSTRUCT NEW NORTH-SOUTH WESTERN COUNTY TRANSPORTATION CORRIDOR
RI	I-10	MONTEREY AVE	DILLON RD	ADD 1 MF LANE EACH DIRECTION
RI	I-15	BUNDY CANYON	I-15/I-215 IC	I-15 ADD 1 MF LANE EACH DIR, BUNDY CANYON TO I-15/I-215 INTERCHANGE (FROM 3 TO 4 MF EACH DIR)
RI	SR-71	SR-91	SAN BERNARDINO COUNTY LINE	WIDEN TO 3 MF LANES EACH DIRECTION
RI	SR-91	PIERCE STREET	ORANGE COUNTY LINE	ADD 1 MF LANES EACH DIRECTION
RI	I-15	SR74	SAN BERNARDINO COUNTY LINE	BUILD HOV/HOT LANES: 2 HOV3+/HOT EACH DIR FROM SR-74 TO SAN BERNARDINO COUNTY LINE
RI	SR-91	ORANGE COUNTY LINE	I-15	BUILD/EXTEND 4 HOT LANES (2 IN EACH DIRECTION) BUILD HOT EB SR91 TO SB I-15 AND NB I-15 TO WB SR91 CONNECTOR LANES

TABLE 3.9-6 (Continued)
DRAFT 2008 RTP PROJECTS WITH POTENTIAL NOISE IMPACTS

CO	Route/Program	From	To	Description
RI	ENHANCED COMMUTER LINK - EAST CORRIDOR	WESTERN RIVERSIDE COUNTY	SAN DIEGO, ORANGE, AND LOS ANGELES COUNTIES	PROPOSED COMMUTER LINK SERVICE AT THE EASTERN SIDE OF I-215 CORRIDOR TO SAN DIEGO AND NEIGHBORING COUNTIES OF ORANGE AND LOS ANGELES THROUGH METROLINK SERVICE CONNECTIONS.
RI	ENHANCED COMMUTER LINK - WEST CORRIDOR	WESTERN RIVERSIDE COUNTY	SAN DIEGO, ORANGE, AND LOS ANGELES COUNTIES	PROPOSED COMMUTER LINK SERVICE AT THE WESTERN SIDE OF I-15 CORRIDOR TO SAN DIEGO AND NEIGHBORING COUNTIES OF ORANGE AND LOS ANGELES THROUGH METROLINK CONNECTIONS. A PROPOSED EXPANSION AN IMPROVEMENT OF THE EXISTING COMMUTER SERVICE FROM MURRIETA/TEMECULA INCLUDING THE CITIES OF PERRIS, MORENO VALLEY, NORCO, AND CORONA
RI	PERRIS VALLEY LINE	CITY OF PERRIS	CITY OF TEMECULA	METROLINK PERRIS VALLEY LINE COMMUTER RAIL EXTENSION FROM PERRIS TO TEMECULA (~16.5 MILES), STATIONS AT NEWPORT RD (@ I-215), CLINTON KEITH RD (@ I-215), AND WINCHESTER RD (SR-79 @ I-215)
RI	METROLINK COMMUTER RAIL	IEOC & 91 LINES		METROLINK CONSTRUCT NEW STATION AT 3360 VAN BUREN BLVD IN RIVERSIDE (PARKING 550 SPACES)
RI	I-10	SAN BERNARDINO COUNTY LINE	I-10/SR60 JCT	ADD EASTBOUND TRUCK CLIMBING LANE
RI	SR-60	BADLANDS AREA EAST OF MORENO VALLEY (NEAR GILMAN SPRINGS RD)	BADLANDS AREA - WEST OF SR-60/I-10 JCT	ADD EASTBOUND TRUCK CLIMBING LANE
SB	SR-18	LOS ANGELES COUNTY LINE	US 395	WIDEN FROM 1 TO 2 LANES EACH DIR
SB	SR-18	0.8 MI WEST OF ORCHARD DR	2.1 MI WEST OF ORCHARD DR	CONSTRUCT PASSING LANES AND TURN LANES
SB	SR-38 (ORANGE/LUGONIA)	REDLANDS CITY LIMIT (W)	REDLANDS CITY LIMIT (E)	WIDEN FROM 1 TO 2 LANES EACH DIR
SB	MENTONE BLVD (SR-38)	WABASH AVE	E/GARNET ST	WIDEN MENTONE BLVD (SR-38) FROM WABASH AVE TO E/GARNET ST FROM 2 TO 4 LANES
SB	SR-62 (TWENTY-NINE PALMS HWY)	FAIRWAY DR	SR-247	WIDEN FROM 2 TO 3 LANES EACH DIR

TABLE 3.9-6 (Continued)
DRAFT 2008 RTP PROJECTS WITH POTENTIAL NOISE IMPACTS

CO	Route/Program	From	To	Description
SB	SR-62	KICKAPOO TRAIL	CHURCH ST.	WIDEN FROM 4-LANES TO 6-LANES AND REALIGN
SB	SR-83 (EUCLID)	MERRIL AV	KIMBALL AV	WIDEN FROM 2 TO 4 LANES EACH DIR
SB	SR-138	SR-18	PHELAN RD	PHASE II: WIDEN 2 TO 4 LANES FROM SR-18 TO PHELAN RD (PHASE I PHELAN RD TO I-15 IN
SB	SR-142 (CHINO HILLS PKWY)	CARBON CANYON RD	PIPELINE DR	WIDEN FROM 2 TO 3 LANES EACH DIR
SB	SR-247 (OLD WOMAN SPRINGS RD)	NORTH OF SR-62	GRIFFITH RD	WIDEN FROM 1 TO 2 LANES EACH DIR
SB	I-10	HAVEN	FORD ST	ADD 1 AUX LANE EACH DIRECTION
SB	I-10	FORD ST.	RIVERSIDE COUNTY LINE	ADD 1 AUX LANE EACH DIRECTION
SB	SR-60	RAMONA AVE IC (R1.5)	SB I-15 CONNECTOR (R10.0)	AUX LANES, WIDEN CONNECTOR, WIDEN RAMPS
SB	US-395	NB FROM 0.84MI S/O DESERT FLOWER RD TO 2.84MI N/O PURPLE SAGE ST, AND FROM 4MI N/O SHADOW MOUNTAIN AVE TO 6.07MI N/O SHADOW MOUNTAIN AVE	SB FROM 2.72MI N/O PURPLE SAGE ST TO 0.95MI S/O DESERT FLOWER RD, AND FROM 5.95MI N/O SHADOW MOUNTAIN AVE TO 3.88MI N/O SHADOW MOUNTAIN AVE	ADD PASSING LANES IN BOTH DIRECTIONS AND ADJUST VERTICAL AND HORIZONTAL ALIGNMENTS
SB	I-10	HAVEN	FORD ST	ADD 1 HOV LANE EACH DIRECTION, WIDEN UC'S, RECONSTRUCT RAMPS
SB	I-10	FORD ST.	RIVERSIDE COUNTY LINE	ADD 1 HOV LANE EACH DIRECTION
SB	I-15	RIVERSIDE COUNTY LINE	I-215	ADD 1 HOV LANE EACH DIRECTION
SB	I-15	I-215	US-395	ADD 1 HOV LANE EACH DIRECTION
SB	I-15	US-395	SR-18/MOJAVE RIVER	ADD 1 HOV LANE EACH DIRECTION
SB	I-215	SR-210	I-15	ADD 1 HOV LANE EACH DIRECTION
SB	I-10	0.1 KM E/O I-15 (PM 9.9)	0.4 KM E/O I-215 (PM R24.5)	INSTALL RMS, CCTV ESU; WIDEN ENTRANCE RAMPS FROM 1 TO 2 LANES AT: EB & WB AT CHERRY AVE, CITRUS AVE, CEDAR AVE, RIVERSIDE AVE AND MT VERNON AVE; WB AT RANCHO AVE; EB AT 9TH ST
SB	I-15	HIGH DESERT CORRIDOR		IN VICTORVILLE/APPLE VALLEY ON I-15 AT EAST/WEST HIGH DESERT CORRIDOR - CONSTRUCT INTERCHANGE
SB	I-15	MOJAVE ST.		NEW INTERCHANGE

TABLE 3.9-6 (Continued)
DRAFT 2008 RTP PROJECTS WITH POTENTIAL NOISE IMPACTS

CO	Route/Program	From	To	Description
SB	SR-60	SR-60 AT CENTRAL AVE (3.8)		ADD AUX LANES AND WIDEN RAMPS, CONST ENTRANCE LOOP RAMP (EA:0C870) PM R2.1-3.0)
SB	SR-60	ARCHIBALD		IN ONTARIO ON SR-60 AT ARCHIBALD AVENUE - WIDEN OFF RAMPS FROM 2 TO 3 LANES
SB	SR-60	EUCLID		IN ONTARIO ON SR-60 AT EUCLID AVENUE - WIDEN OFF RAMPS FROM 2 TO 3 LANES
SB	SR-60	SR-60 AT MOUNTAIN AVE (5.8)		WIDEN RAMPS, CONST AUX LANES
SB	I-215	SR-30	I-15	ADD 1 MF LANE EACH DIRECTION
SB	I-15	I-215 (DEVORE INTERCHANGE) (PM 15.0 - R16.0)		ON I-15 WIDEN FROM 3 TO 4 MF EACH DIR (GLEN HELEN TO KENWOOD); ADD 2 TRUCK BYPASS LANES EA DIR FROM 0.5 MI S/O INTERCHANGE TO 0.5 MI N/O INTERCHANGE; ADD NB AUX LANE FROM I-215 ON-RAMP TO KENWOOD OFF-RAMP
SB	SR-210	I-215	I-10	ADD 1 MF LANE AND 1 HOV LANE EACH DIRECTION AND WIDEN UC'S
SB	METROLINK COMMUTER RAIL	COUNTYWIDE		SERVICE EXPANSION; SB LINE 72 DAILY TRAINS, RIVERSIDE LINE 46 DAILY TRAINS, IEOC LINE 28 DAILY TRAINS
SB	SAN BERNARDINO-REDLANDS EXTENSION	4TH ST/MT. VERNON	GROVE/CENTRAL	EXTEND RAIL SERVICE TO REDLANDS (10 MILES); RAIL TECHNOLOGY TBD; 15-MIN. FREQ. DAILY
SB	I-15	DEVORE	SUMMIT	TRUCK CLIMBING LANE
VEN	HWY 33	AT STANLEY AVENUE		NEW TWO-LANE FREEWAY BRIDGE FOR SB TRAFFIC
VEN	SR-118	JCN 23 & 34 IN MOORPARK		CONSTRUCT NEW WEIGH STATION
VEN	METROLINK COMMUTER RAIL	IN VENTURA COUNTY		METROLINK COMMUTER RAIL SERVICE EXPANSION
VEN	MULTIMODAL TRANSPORTATION CENTER	IN DOWNTOWN VENTURA		SERVICE CENTER, PARKING, LAYOVER, AND RETAIL SPACE FOR RAIL, BUS, AND BICYCLE COMMUTERS.
REG	MAGLEV	PORTS OF LOS ANGELES/LONG BEACH	HOBART YARD	HIGH SPEED REGIONAL TRANSPORT (HSRT): SPUR FROM PORTS OF LOS ANGELES/LONG BEACH TO HOBART YARD FOR FREIGHT MOVEMENT
REG	HIGH SPEED RAIL	ANAHEIM	UNION STATION	HIGH SPEED REGIONAL TRANSPORT (HSRT): (CALIFORNIA HIGH-SPEED RAIL AUTHORITY) - ANAHEIM TO UNION STATION
REG	MAGLEV	LAX/WEST LA	ONTARIO AIRPORT	HIGH SPEED REGIONAL TRANSPORT (HSRT): IOS (LAX-WEST LA-UNION STATION-WEST COVINA-ONTARIO AIRPORT)

TABLE 3.9-6 (Continued)
DRAFT 2008 RTP PROJECTS WITH POTENTIAL NOISE IMPACTS

CO	Route/Program	From	To	Description
REG	MAGLEV	ONTARIO AIRPORT	SAN BERNARDINO AIRPORT	HIGH SPEED REGIONAL TRANSPORT (HSRT): IOS EXTENSION FROM ONTARIO AIRPORT TO SAN BERNARDINO AIRPORT
REG	MAGLEV	ANAHEIM	ONTARIO AIRPORT	HIGH SPEED REGIONAL TRANSPORT (HSRT): (CALIFORNIA-NEVADA SUPERSPEED TRAIN COMMISSION) - ANAHEIM TO ONTARIO AIRPORT
REG	HIGH DESERT CORRIDOR	I-5	US-395	HIGH DESERT CORRIDOR, CONSTRUCT NEW 4-6 LANE FACILITY: E-W I-14 TO US-395 (CONNECTING AT SB CO #20020144), E-W I-5 TO SR-14, N-S SR-14 TO SR-138.
REG	I-710 (GAP CLOSURE)	I-710 & VALLEY BOULEVARD	CALIFORNIA BL & PASADENA AVE	ADD 3 MIXED FLOW + 1 HOV LANE IN EACH DIRECTION IN TUNNEL TO COMPLETE THE I-710 FREEWAY
REG	CETAP - RIVERSIDE COUNTY TO ORANGE COUNTY	WESTERN RIVERSIDE COUNTY	ORANGE COUNTY	CETAP - RIVERSIDE COUNTY TO ORANGE COUNTY - CONSTRUCT NEW INTERCOUNTY TRANSPORTATION CORRIDOR(S): CORRIDOR A - 2 MF EACH DIR ON NEW FACILITY PARALLEL TO SR-91, FROM SR-241 TO I-15, WITH IC AT SR-241, SR-71, I-15; CORRIDOR B - 2 TOLL EACH DIR ON NEW FACILITY FROM I-15/MID-COUNTY PKWY TO SR-241/SR-133
REG	I-710	PORTS OF LOS ANGELES/LONG BEACH	SR-60	710 CORRIDOR USER-FEE BACKED CAPACITY ENHANCEMENT. WIDEN TO 5 MF EACH DIR FROM PORTS TO SR-60 INCL. INTERCHANGE IMPROVEMENTS. FROM OCEAN BLVD TO SR-60, CONSTRUCT 2 USER-FEE BACKED TRUCK LANES EACH DIR.

SOURCE: SCAG 2007

TABLE 3.9-7
PERCENTAGE OF ROADWAYS WHERE NOISE LEVELS EXCEED 66 DBA* (REGARDLESS OF LAND USE)

		Percent						
Scenario	**Facility**	**Imperial County**	**Los Angeles County**	**Orange County**	**Riverside County**	**San Bernardino County**	**Ventura County**	**Total (region-wide)**
2008	Freeways	100%	92%	98%	100%	99%	98%	**97%**
	Arterials/ Collectors	10%	15%	24%	15%	10%	20%	**15%**
No Project 2035	Freeways	100%	92%	98%	99%	98%	97%	**96%**
	Arterials/ Collectors	22%	21%	31%	35%	24%	25%	**25%**
2008 RTP	Freeways	100%	92%	99%	100%	100%	99%	**97%**
	Arterials/ Collectors	19%	20%	29%	29%	18%	25%	**22%**

A noise level above 66dBA is the Caltrans noise abatement criteria for sensitive receptors; this table does not include consideration of adjacent land uses but evaluates all roadways equally regardless of adjacent uses.

SOURCE: SCAG 2007

MM-NO.15: Project implementation agencies shall 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-NO.16: Project implementation agencies shall, 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-NO.17: Project implementation agencies shall 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-NO.18: Project implementation agencies shall, to the extent feasible and practicable, improve the acoustical insulation of dwelling units where setbacks and sound barriers do not sufficiently reduce noise.

MM-NO.19: The project implementation agencies shall 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-NO.20: To reduce noise impacts, maximize distance of the HSRT route alignment from sensitive receptors. If the HSRT guideway is constructed along the center of a freeway, operation 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-NO.21: Reduce HSRT speed in the vicinity of sensitive receptors.

MM-NO.22: As a last resort, eliminate the noise-sensitive receptor by acquiring rail and freeway rights-of-way. This would ensure the effective operation of all transportation modes.

MM-NO.23: Passenger stations, central maintenance facilities, decentralized maintenance facilities, and electric substations should be located away from sensitive receptors.

Significance after Mitigation

Although mitigation measures are implemented for the impact, it may not reduce noise levels to below regulatory levels in all circumstances. This impact would remain **significant**.

Cumulative Impact 3.9-3: Cumulative ambient noise levels could increase in urban areas of the region to exceed normally acceptable noise levels or have substantial increases in noise 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 facilities as well as increased use of existing transit facilities, etc.).

The projects included in the 2008 RTP could have a significant impact on noise in the region. As described under Impact 3.9-1, many of the projects involve construction which would result in significant short term impacts. While the construction noise is temporary and short term at the project level, the cumulative construction noise region wide could be significant. Over the course of the planning horizon there is likely to be constant construction within the region.

The region is expected to add an additional 5.14 million people by 2035, necessitating the construction of new homes and additional infrastructure to accommodate increased population. This increase in population would likely lead to a general increase in ambient noise throughout the region.

Cumulative transportation noise could also increase. This ambient noise increase could be related to aircraft overflights, port noise, ship horns, railroads, as well as freeway, arterial and transit noise.

Mitigation Measures

Mitigation measures intended to reduce the noise impacts on sensitive receptors are part of the 2008 RTP. These include: site design, buffers, soundwalls, etc. Further reduction in noise impacts would be obtained through the implementation of the measures described in **MM-NO.14 through MM-NO.23.**

Significance after Mitigation

Mitigation measures **MM-NO.15** through **MM-NO.23** may not reduce noise levels to below regulatory levels in all cases. Therefore, the impact would be **significant.**

Comparison with the No Project

Through the construction of transportation projects, and increases in traffic volume and speed, the 2008 RTP projects could create substantially more noise than the No Project Alternative. By not implementing the 2008 RTP (No Project Alternative) the levels of cumulative ambient noise could be less than with the proposed 2008 RTP implementation as a result of fewer sources and reduced speeds.

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 No Project impacts for Impact 3.9-1 and 3.9-2.

Indirect Impacts

The 2008 RTP 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 2008 RTP would concentrate population in urban areas that generally have higher ambient noise levels. The 2008 RTP 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 impacts for Impact 3.9-3.

References – Noise

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3.10 Open Space

This section describes open space in the SCAG region, identifies the potential impacts of the RTP on open space, includes mitigation measures for the impacts and evaluates residual impacts. The information contained in this section is based on data and mapping compiled for the Regional Open Space Program.

The information contained in this chapter is a summary of information contained in the Regional Open Space Program Profile of Regional Open Space Resources. [1]

Environmental Setting

Land Uses

The following categories of land uses identified in SCAG's 2005 land use inventory are considered part of regional open space and discussed in this chapter: open space and recreation lands, water, vacant, and agriculture.

In the region as a whole, nearly 23 million acres fit the "open" category. 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 Bureau of Land Management (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.

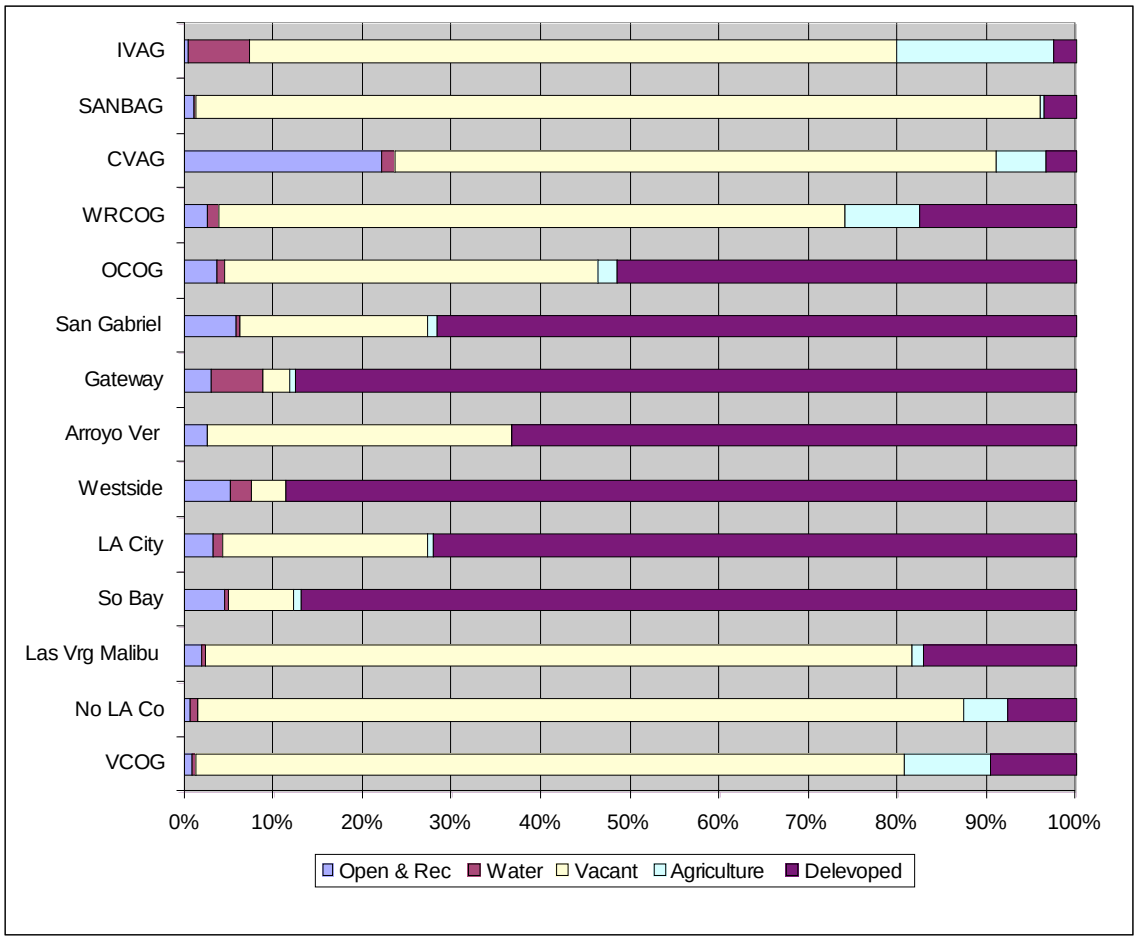
General Plan Land Use Categories

In connection with its planning programs, SCAG compiled the general plan land use maps of its member agencies as of 2004, collapsed the land use classifications into 25 categories, and mapped the distribution of the collapsed categories across the region. **Table 3.10.1** indicates the regional totals and subregional distribution (SCAG subregions are shown on **Map 2.1-2**) of the general plan land use categories; **Map 3.10-1** shows the geographic distribution while **Map 3.10-2**

[1] SCAG, 2007; unpublished data.

shows the General Plan land use classifications. **Figure 3.10-1** shows how the subregions vary in terms of the proportion of the open and developed land uses found in each.

FIGURE 3.10-1
"OPEN" AND DEVELOPED USES IN EACH SCAG SUBREGION
(PERCENTAGE PER TYPE)



SOURCE: SCAG, 2007

Ownership

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 3.10-3** shows the general ownership across the region and **Figure 3.10-2** shows ownership by subregion.

TABLE 3.10-1
"OPEN" AND OTHER LAND USES BY SCAG SUBREGION (acres)[1]

Land Use Category	Ventura Co	North LA Co	Las Virgenes Malibu	South Bay Cities	City of LA	Westside Cities	Arroyo Verdugo	Gateway Cities	San Gabriel	Orange Co	Western Riverside	Coachella Valley	San Bernardino Co	Imperial Co	Total
Open Space and Recreation[2]															
Beach Parks	603	0	326	322	707	236	0	249	0	1,350	0	0	0	0	3,791
Developed Local Parks and Recreation	2,005	1,098	180	1,362	3,363	399	408	2,421	2,474	6,525	2,978	805	3,341	788	28,145
Developed Regional Parks and Recreation	285	321	155	96	911	51	0	826	1,095	1,409	977	280	1,139	73	7,617
Golf Courses	3,408	1,431	410	1,057	3,924	30	423	1,808	3,133	7,307	6,234	15,412	4,462	329	49,368
Other Open Space and Recreation	1,074	2,544	202	157	361	68	40	233	311	1,185	2,364	1,245	4,548	947	15,280
Specimen Gardens and Arboreta	49	5	0	87	15	1	152	0	367	26	14	2	18	0	736
Undeveloped Local Parks and Recreation	222	92	18	9	0	0	0	0	165	4	9	78	7	17	623
Undeveloped Regional Parks and Recreation	142	4,607	741	92	523	159	0	101	5,259	0	23,681	673,204	122,074	0	830,583
Wildlife Preserves and Sanctuaries	896	571	35	63	448	0	0	16	95	1,009	3,058	1,171	17	11,402	18,780
Subtotal	8,685	10,670	2,066	3,245	10,252	944	1,022	5,654	12,897	18,814	39,315	692,197	135,607	13,555	954,924
Water															
Harbor Water Facilities	0	0	0	0	2,249	0	0	10,515	0	117	0	0	0	0	12,882
Marina Water Facilities	215	2	4	43	191	160	0	175	0	294	0	0	131	82	1,298
Water Within a Military Installation	437	5,409	0	0	0	0	0	0	0	11	58	0	11	44,533	50,458
Water, Undifferentiated	4,931	7,278	284	293	1,085	246	2	754	1,128	3,936	18,805	47,413	20,217	151,728	258,099
Subtotal	5,583	12,689	289	336	3,525	406	2	11,444	1,128	4,358	18,862	47,413	20,359	196,343	322,737
Vacant[3]															
Abandoned Orchards and Vineyards	341	370	5	0	19	0	0	0	2	91	966	365	968	155	3,282
Beaches (Vacant)	332	0	102	18	0	0	0	0	0	52	1	0	0	0	505
Former Base Vacant Area	0	0	0	0	0	0	0	0	0	1,869	2,910	0	2,513	7,283	14,575
Vacant Area	2,769	44,981	0	6	350	0	0	0	0	3,070	1,671	109,531	1,849,285	436,346	2,448,010
Vacant Undifferentiated	929,202	1,325,731	82,477	5,476	73,584	694	13,615	6,297	47,999	208,317	1,070,444	2,008,263	10,335,930	1,630,018	17,738,048
Vacant With Limited	621	1,139	43	61	98	0	3	8	94	353	3,141	2,760	2,161	8,856	19,336

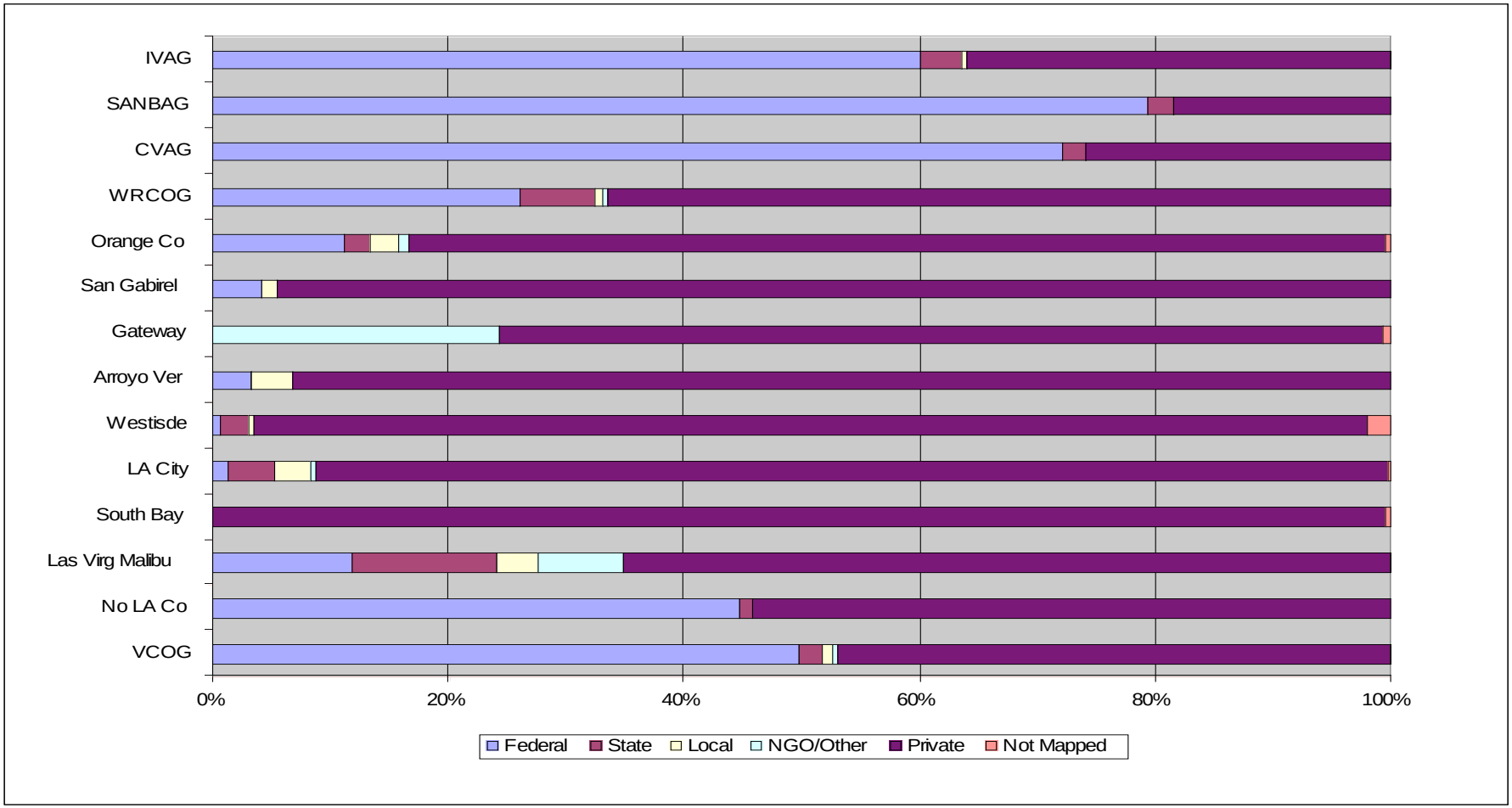
TABLE 3.10-1 (Continued)
"OPEN" AND OTHER LAND USES BY SCAG SUBREGION (acres)[1]

Land Use Category	Ventura Co	North LA Co	Las Virgenes Malibu	South Bay Cities	City of LA	Westside Cities	Arroyo Verdugo	Gateway Cities	San Gabriel	Orange Co	Western Riverside	Coachella Valley	San Bernardino Co	Imperial Co	Total
Improvements															
Subtotal	933,264	1,372,221	82,628	5,562	74,050	694	13,618	6,305	48,095	213,752	1,079,133	2,120,920	12,190,857	2,082,658	20,223,756
Agriculture[4]															
Dairy, Intensive Livestock, and Associated Facilities	82	139	0	0	0	0	0	6	7	0	3,109	70	6,499	2,830	12,744
Horse Ranches	2,777	2,972	587	72	606	0	50	111	502	649	8,605	2,076	3,175	162	22,344
Irrigated Cropland and Improved Pasture Land	42,419	60,012	233	67	467	0	0	177	439	3,330	34,950	120,171	40,613	486,483	789,361
Non-Irrigated Cropland and Improved Pasture Land	6,636	11,081	31	0	10	0	0	0	0	1,518	48,725	0	1,248	265	69,514
Nurseries	5,624	140	61	443	627	0	1	851	1,275	2,601	3,607	1,411	1,266	153	18,060
Orchards and Vineyards	54,115	2,347	224	15	90	0	0	39	114	2,785	25,048	43,268	8,970	9,127	146,142
Other Agriculture	1,330	1,140	56	0	18	0	0	8	34	254	3,113	4,092	2,058	4,239	16,341
Subtotal	112,985	77,830	1,192	596	1,818	0	51	1,192	2,372	11,137	127,157	171,088	63,829	503,259	1,074,506
Transportation															
Airports	943	981	0	424	3,654	157	532	990	327	584	1,068	1,832	7,136	1,236	19,864
Bus Terminals and Yards	21	54	4	23	282	23	3	125	91	198	50	24	168	24	1,091
Freeways and Major Roads	2,972	3,319	343	1,226	6,820	231	708	3,443	4,192	8,270	6,193	5,275	15,505	6,087	64,584
Harbor Facilities	33	0	0	0	2,587	0	0	2,492	0	0	0	0	0	0	5,112
Park-and-Ride Lots	36	73	0	29	58	1	10	78	66	51	23	0	82	0	505
Railroads	68	70	0	235	976	0	14	1,128	338	290	375	757	2,801	894	7,947
Truck Terminals	81	37	0	77	197	0	0	827	247	180	348	117	1,384	136	3,632
Subtotal	4,154	4,535	347	2,014	14,574	412	1,268	9,082	5,261	9,573	8,056	8,005	27,077	8,377	102,734
All Other Developed Land	109,106	118,700	17,560	62,673	218,103	15,698	24,103	163,643	158,236	253,782	261,439	100,429	438,518	63,990	2,005,979
TOTAL	**1,173,776**	**1,596,644**	**104,081**	**74,426**	**322,323**	**18,154**	**40,063**	**197,321**	**227,989**	**511,417**	**1,533,963**	**3,140,051**	**12,876,247**	**2,868,182**	**24,684,635**

1 "Open" uses include open space and recreation lands, water, vacant lands in a natural state, and agriculture.
2 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 recreation purposes.
3 Includes national forests, state parks, and other federal/state lands that are kept in a natural state and are open to the public for recreation purposes.
4 As identified based on aerial imagery interpretation; does not include most grazing lands, which show as "undifferentiated vacant".

SOURCE: Southern California Association of Governments 2005 Land Use Inventory (2006).

FIGURE 3.10-2
GENERALIZED OWNERSHIP IN EACH SCAG SUBREGION
(PERCENTAGE PER TYPE)



SOURCE: SCAG, 2007

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 the landscape linkages in the region have been identified further 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 limit options for maintaining and/or threaten to eliminate existing connections between cores. The linkages identified in the statewide and regional studies are in locations where existing or proposed development limit options for maintaining and/or threaten to eliminate existing connections between cores.

Fragments are patches of habitat smaller than 1,000 acres located either within (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.

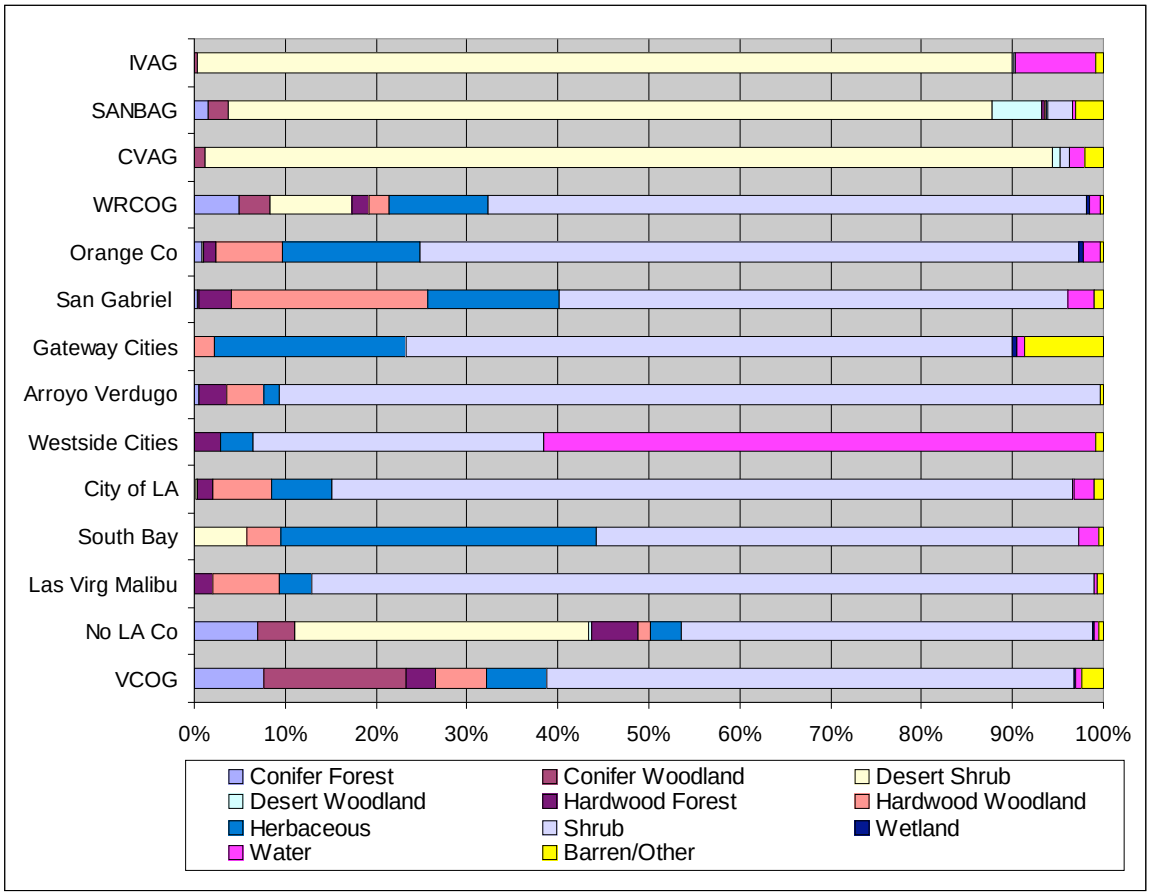
Unprotected lands are areas that are not subject to requirements or arrangements that would keep them in a natural state.

Nearly 21 million acres in the region are considered natural lands as defined in the Regional Open Space Program. 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.

A description of wildlife linkages and linkage design areas is included in the description of biological values and ecological context. An overview of regional-scale conservation programs in Southern California is included in the discussion of ownership and protection status. 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. Information on land cover and vegetation can be found in **Chapter 3.3 Biological Resources**, of the PEIR. **Figure 3.10-3** shows the proportion of natural lands in each subregion.

FIGURE 3.10-3
NATURAL LANDS IN EACH SCAG SUBREGION (Percentage Per Type)



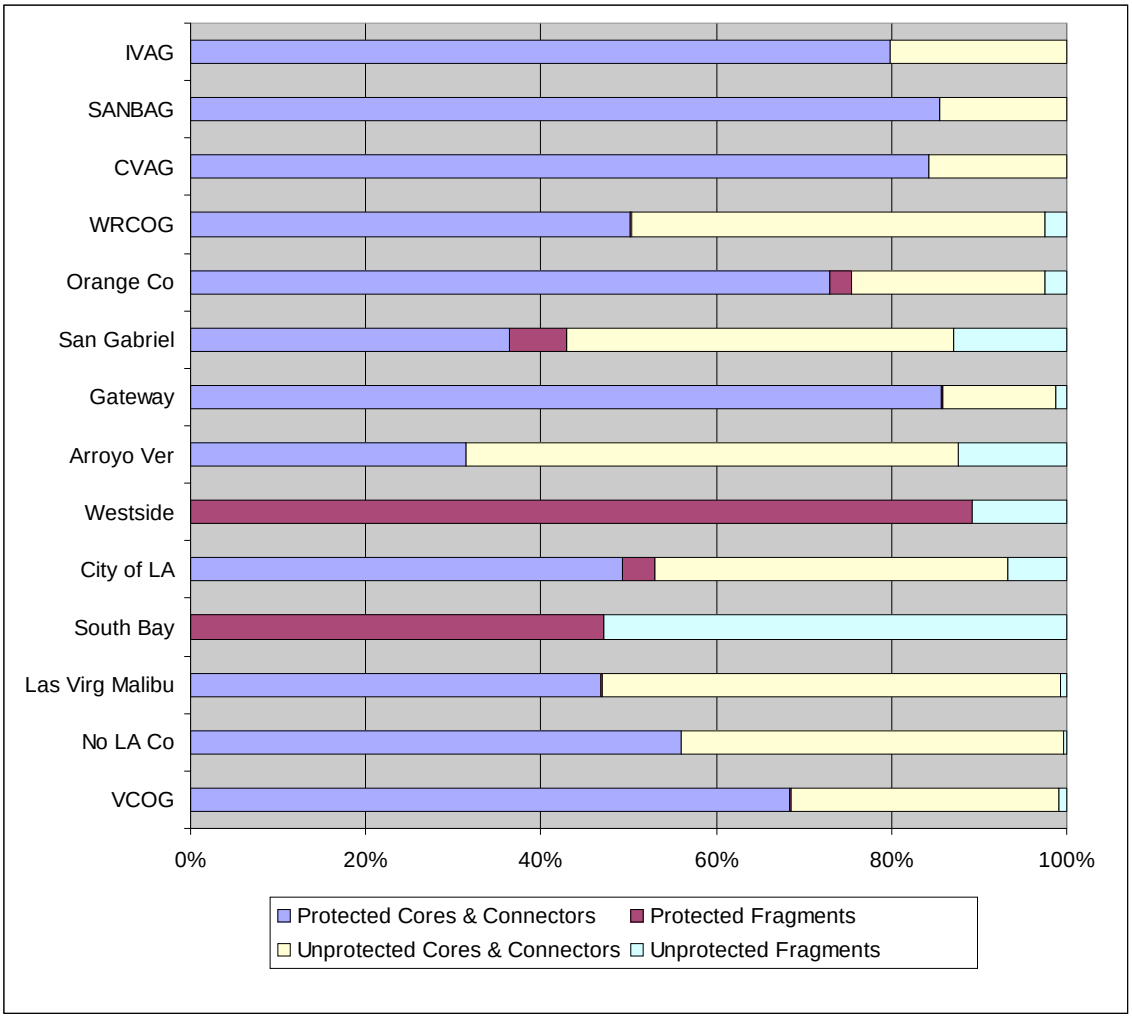
SOURCE: SCAG, 2007

"Protected" and "Unprotected" Natural Lands

Map 3.10-4 shows the distribution of "protected" and "unprotected" cores, connectors, and fragments within the SCAG region and vicinity. It also shows the location of the protected and unprotected areas in relation to wildlife linkages, linkage design areas, park and recreation areas (from 2005 land use inventory, agricultural lands, and developed lands). **Figure 3.10-4** shows the proportion of natural lands in each subregion within the "protected" and "unprotected" categories.

Approximately 80 percent (more than 16 million acres) of natural lands in the SCAG region are in public ownership or in reserves. Nearly 90% 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.

FIGURE 3.10-4
"PROTECTED" AND "UNPROTECTED" NATURAL LANDS IN EACH SCAG SUBREGION (PERCENTAGE PER CATEGORY)



SOURCE: SCAG, 2007

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) website: http://www.dfg.ca.gov/nccp/index.html.

Community Open Space

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.

To provide a perspective on community open space issues and trends within the region, sixteen SCAG cities were selected as case studies. In addition, summaries were prepared of existing plans and programs that are focused on planning and providing community open space.

Case Studies

The case study cities include:

- Compton
- Long Beach
- Los Angeles
- Palmdale
- Santa Clarita
- Irvine
- Ontario
- Rialto
- Inglewood
- Torrance
- Azusa
- Pomona
- Ventura
- Culver City
- Moorpark
- Riverside

Each of these cities is a Compass 2% Opportunity Area, and each deals with a different community open space challenge. The types of challenges represented by the cities range from finding ways to add community open space to essentially built-out areas to coordinating park and recreation planning with water quality and watershed management requirements.

To provide a basis for comparing the cities in terms of their existing community open space, the following information was compiled for each: population, areas, population density, ethnic mix,

TABLE 3.10-2
PARKS/PEOPLE-RELATED INFORMATION FOR THE CASE STUDY CITIES

City	SCAG Subregion	Total Population	Area (Square Miles)	Population Density (Persons/ Square Mile	% White	% Hispanic	% African-American	% Native American	% Asian	Most recent Open Space Element	# of Parks	Park Acreage	Park Acres/ 1,000 People
Compton	Gateway Cities	93,493	10.1	9,257	1.02%	56.84%	39.86%	0.18%	0.20%	1991	14	95	1.02
Long Beach	Gateway Cities	461,522	50.4	9,157	33.13%	35.77%	14.48%	0.38%	11.90%	2002	77	2101	4.55
Los Angeles	Los Angeles City	3,694,820	469.1	7,876	29.75%	46.53%	10.88%	0.24%	9.87%	1973	366	20,178	5.46
Palmdale	North LA Co	116,670	105	1,111	41.00%	37.71%	14.10%	0.53%	3.71%	2004	11	243	2.16
Santa Clarita	North LA Co	151,088	47.8	3,161	69.26%	20.50%	1.96%	0.35%	5.13%	1991	22	387	2.56
Irvine	Orange Co	143,072	46.2	3,097	57.04%	7.37%	1.38%	0.11%	29.71%	1999	51	2182	15.3
Ontario	San Bernardino Co	158,007	49.8	3,173	26.61%	59.88%	7.16%	0.30%	3.74%	1998	27	683	4.32
Rialto	San Bernardino Co	91,873	21.9	4,195	21.46%	51.21%	21.72%	0.40%	2.35%	1992	10	236	2.57
Inglewood	South Bay Cities	112,580	9.1	12,371	4.11%	46.04%	46.42%	0.19%	1.08%	1995	10	125	1.11
Torrance	South Bay Cities	137,946	20.5	6,729	52.36%	12.79%	2.11%	0.26%	28.42%	1992	28	319	2.31
Azusa	San Gabriel Valley	44,712	8.9	5,024	24.21%	63.79%	3.52%	0.45%	5.94%	2004	11	217	4.85
Pomona	San Gabriel Valley	39,804	22.8	1,746	17.41%	30.71%	0.90%	0.32%	48.74%	1976	28	446	11.21
Ventura	Ventura Co	100,916	19	5,311	68.09%	24.35%	1.27%	0.63%	2.91%	1989	29	1048	10.39
Culver City	Westside Cities	38,816	5.1	7,611	48.11%	23.70%	11.69%	0.29%	11.93%	1996	12	91	2.35
Moorpark	Ventura Co	31,415	19	1,653	62.43%	27.81%	1.38%	0.26%	5.53%	1986	14	151	4.81
Riverside	Western Riverside	255,166	78.1	3,267	45.56%	38.14%	7.07%	0.55%	5.58%	1994	53	1,155	4.53

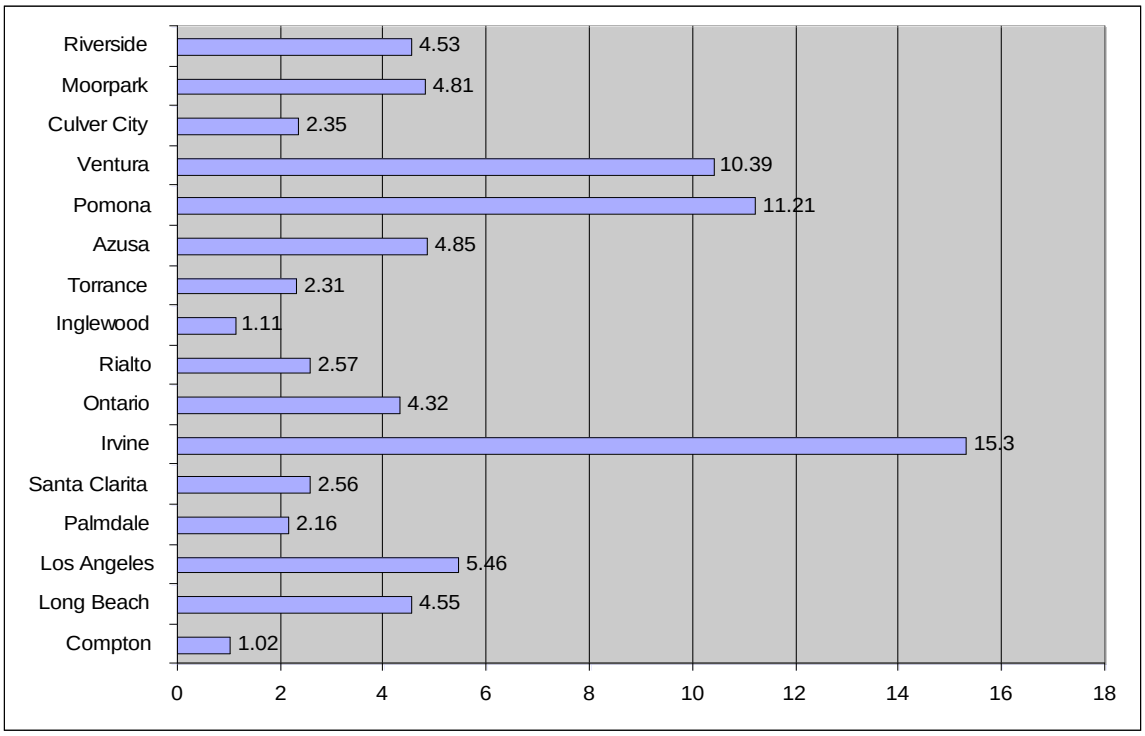
SOURCE: SCAG, 2007

number of parks, and total acres of parks. The ratio of local parks per 1000 residents was then calculated and compared with the ratios recommended by the National Recreation and Parks Association (NRPA 1996). In addition, the proximity of the city to existing regional parks was determined, together with whether the city has community gardens, agricultural lands, greenbelts/greenways, trails and bikeway systems, an urban forestry program, and other relevant open space plans or programs. **Table 3.10-2** shows the relevant park information for the case study cities.

Figure 3.10-5 shows the parks/people ratio for each city; **Table 3.10-3** indicates the NRPA standards recommended for park types. As measured against NRPA's overall parks/people standard (6.25-10 acres/1000 people), three cities exceed the guidelines (Irvine, Pomona, and Ventura); all others are below the standard. As measured against the NRPA guidelines for community and regional parks (5.0-10.5 acres/1000 people), eight cities meet or come close to the ratio.

Ten of the cities have urban forestry programs, eight have greenway and trails systems, seven are participating in river park and watershed planning projects, and five have community garden programs. Fourteen of the cities have at least one type of active agricultural operation (other than community gardens) within their jurisdictions, and ten are in subregions where the amount of developed land exceeds the remaining amount of open space and farmland.

FIGURE 3.10-5
PARKS-TO-PEOPLE RATIO IN CASE STUDY CITIES
(PARK ACRES PER 1,000 PEOPLE)



SOURCE: SCAG, 2007

TABLE 3.10-3
NATIONAL RECREATION AND PARKS ASSOCIATION GUIDELINES

Type of Park[1]	Service Area	Desirable Size	Acres/1,000 Population
Mini-Park	>0.25 mile radius	1 acre or less	.25 to .50
Neighborhood Park/Playground	0.25-0.5 mile radius per 5,000 people	15+ acres	1.0 to 2.0
Community Park	1-2 mile radius	25+ acres	5.0 to 8.0
Regional Park	Several communities, within 1-hour drive time	200+ acres	5.0 to 10.0
NRPA Parks/People Standard	---	---	6.25-10.5 acres

[1] NPRA also has developed standards for sports facilities (see NRPA 1996).

SOURCE: National Recreation and Parks Association, Park, Recreation, Open Space and Greenway Guidelines, 1996.

Agricultural Lands

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.

This section describes the distribution of farmlands and rangelands in the SCAG region and vicinity 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 2005 estimates prepared by the California Department of Conservation (CDC), there are approximately 2.2 million acres of agricultural lands in the SCAG region: approximately 856,000 acres of farmland and 1.2 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 3.10-4**, there is substantially more farmland than rangeland in Ventura, Riverside, and Imperial counties and the reverse in Los Angeles, Orange, and San Bernardino counties. Kern County has more farmland than the six SCAG counties combined and also has more total acres of rangeland. **Map 3.10-5** shows the regional distribution of important farmlands and grazing lands. **Figure 3.10-6** shows the proportion of agricultural land types within the SCAG counties and in adjacent Kern and San Diego counties.

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.

TABLE 3.10-4
ESTIMATED FARMLANDS AND RANGELANDS IN THE SCAG REGION AND VICINITY (2005 ACRES)

Farmlands and Rangelands	Ventura Co	Los Angeles Co	Orange Co	Riverside Co	San Bernardino Co	Imperial Co	SCAG Region
Farmland of Local Importance	198,087	8,684	0	244,848	2,928	33,333	454,547
Prime Farmland	16,817	33,218	7,260	134,429	20,316	196,928	212,039
Farmland of Statewide Importance	47,192	1,028	620	48,499	8,776	313,217	106,116
Unique Farmland	34,978	1,120	5,601	38,691	2,653	2,133	83,043
All Farmland	297,074	44,050	13,481	466,467	34,673	545,611	855,745
Grazing	29,075	228,826	35,872	116,029	915,549	0	1,325,351
Total	**326,149**	**272,876**	**49,353**	**582,496**	**950,222**	**545,610**	**2,181,096**

SOURCE: California Department of Conservation, 2005 estimates.

Federal Agencies and Regulations

The Environmental Protection Agency (EPA)

The EPA implements 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.

Department of Interior

United States Bureau of Land Management (BLM)

The BLM manages approximately 10 million acres of the total 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.

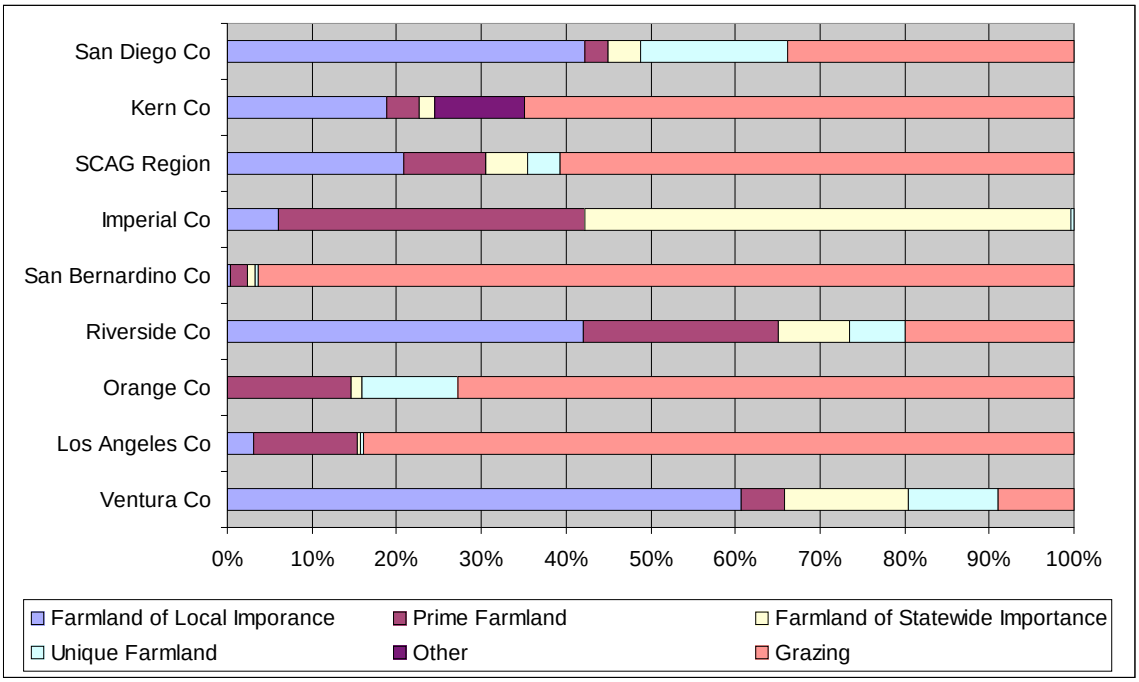
United States Fish and Wildlife Service (USFWS)

The USFWS administers the Federal Endangered Species Act (FESA) 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).

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.

FIGURE 3.10-6
AGRICULTURAL LANDS IN SCAG COUNTIES AND VICINITY
(PERCENTAGE BY TYPE)



SOURCE: SCAG, 2007

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.

U.S. Department of Agriculture, 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.

United States Army Corps of Engineers (USACE)

Among its responsibilities, the USACE 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 USACE 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.

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. Technical Committee, awards funds to qualified entities to conduct their farmland protection programs. Although a minimum of 30 years is required for conservation easements, priority is given to applications with perpetual easements.

Federal 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.

State Agencies and Regulations

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.

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.[2] As part of the Coastal Act, cities and

[2] The other federally designated agency is the Bay Conservation and Development Commission (BCDC) which operates outside of the SCAG region.

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.[3]

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 Department of Forestry and Fire Protection (CDF)

The CDF reviews and approves plans for timber harvesting on private lands. In addition, through its responsibility for fighting wildland fires, the CDF plays a role in planning development in forested areas.

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.

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).

Public Agencies

Public agencies are entrusted with compliance with 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.

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3 Fulton, W. 1999. *Guide to California Planning.* Point Arena, CA: Solano Press Books.

California Land Conservation Act of 1965 (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 (contract) 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 purpose at a rate consistent with their actual use, rather then potential market value.

Farmland Security Zone: August of 1998, the Legislature enhanced the Williamson Act with the farmland security zone (FSZ) provisions. The FSZ provisions offer landowners greater property tax reduction in return for a minimum rolling contract term of 20 years.

California Farmland Conservancy Program

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:

Local Agencies and Regulations

Southern California Association of Governments (SCAG)

As related to land use, SCAG is authorized to undertake the intergovernmental review for federal assistance and direct federal development pursuant to Presidential Executive Order 12,372. Pursuant to CEQA (PRC 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 Section 65584(a). SCAG's RHNA provides a tool for coordinating local housing development strategies.

SCAG's *Regional Comprehensive Plan and Guide (RCPG)*[4] is intended to provide a framework for decision making by local governments regarding growth and development. The RCPG includes strategies for local governments to use on a voluntary basis to reconcile local needs with state and federal planning requirements.

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

[4] Southern California Association of Governments (SCAG). March 1999. Regional Comprehensive Plan and Development Guide. Los Angeles, CA: SCAG. This document is in the process of being substantially updated.

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.

Local Agency Formation Commissions

The local agency formation commission (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.[5] 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.

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 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.

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5 Governor's Office of Planning and Research. 1997. *LAFCOs, general plans, and city annexations*. Sacramento, CA: Author.

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.

Growth Control

Local growth control endeavors 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.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the proposed 2008 RTP on existing open space and existing plans and policies.

Comparison with the No Project

The analysis of land use includes a comparison of the expected future conditions with the 2008 RTP to 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 2008 RTP.

Determination of Significance

This analysis evaluates land uses most likely to be affected by the construction and operation of the highway, freight rail, and transit projects in the proposed Plan and implementation of transportation and urban form policies and programs included in the Plan. GIS was used to overlay proposed Plan highway, freight rail, and transit alignments and the associated growth projection onto 2005 aerial photography of the existing land uses for the SCAG region. In addition to this GIS analysis, land use effects of arterial investments and undefined alignments were also considered. The significance criteria below were applied to determine if resulting changes in land use would be significant. The methodology for determining the significance of these impacts compares the future Plan conditions to the existing setting, as required in CEQA Guidelines Section 15126.2(a). In addition, general plan maps submitted by SCAG member cities and counties were analyzed to evaluate potential conflicts with General Plan land uses.

Significance Criteria

A significant impact is defined as "a substantial or potentially substantial, adverse change in the environment" (Public Resource Code § 21068). The proposed 2008 RTP would have a significant impact if implementation would:

- Result in a substantial loss or disturbance of existing prime farmland, grazing land, open space, or recreation land;
- Conflict with any applicable habitat conservation plan or natural community conservation plan;
- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facilities would occur; or
- Result in a cumulatively considerable impact on open space and/or agricultural lands.

Impacts and Mitigation Measures

Implementation of the 2008 RTP would affect open space and agricultural lands in the region by the addition of new facilities in areas that currently undisturbed/vacant or through the expansion of existing facilities such that habitat would be fragmented or could no longer sustain itself as open space. Expected significant impacts include a loss of prime farmlands, grazing lands, open space and recreation lands, and cumulatively considerable changes to land use and the intensity of land use.

Short-term construction related impacts and long-term or offsite impacts from new facilities would potentially occur as a result of implementation of the 2008 RTP. Below are descriptions of the types of direct impacts foreseeable from new transportation projects proposed in the 2008 RTP. Indirect impacts from the changes in population distribution expected to occur due to the 2008 RTP's transportation investments and transportation and land use policies also are discussed under cumulative impacts. SCAG used GIS analysis to analyze where major freeway, rail, and transit projects identified in the 2008 RTP intersect areas used for agriculture. A 300-foot buffer (150 feet on either side) was drawn around the freeway, rail, and transit projects in the 2008 RTP to compute the number of agricultural acres potentially affected by the projects in the 2008 RTP. The results of the analysis are discussed below. The 2008 RTP includes arterial investments and goods movement capacity enhancements that were not included in the GIS analysis. The alignments of these improvements have not been developed to the point that they can be reliably overlaid onto agricultural lands using GIS. These projects would potentially cause additional adverse effects on open space and agricultural lands.

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.

On-going and subsequent planning work being pursued by SCAG will comprehensively address open space conservation. This work will go beyond the necessary mitigation for the Regional Transportation Plan to design approaches to achieve defined sustainability targets.

Impact 3.10-1: Implementation of the proposed 2008 RTP could result in substantial disturbance and/or loss of prime farmlands and/or grazing lands, throughout the six-county SCAG region.

Implementation of the 2008 RTP could result in long term impacts to agricultural lands in the region, by adding transportation infrastructure to parts of the region that currently serve as agricultural lands.

Figure 3.10-1: General Land Use Patterns and **Figure 3.10-6** Prime Agricultural Farm Land 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. 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, there may be impacts to agricultural and/or open space resources. The GIS analysis prepared for the PEIR indicated that construction and operation of freeway, rail, and transit projects in the 2008 RTP could affect up to 850 acres of prime farmland and up to 7,000 acres of grazing lands.

Transit improvements included in the 2008 RTP are generally located in urbanized areas and therefore are not likely to result in significant impacts to agricultural lands. Several other types of projects identified in the 2008 RTP would have the potential to create a significant impact on agricultural lands. 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.

The initial operating segment (IOS) of the HSRT system, as currently planned, would run from West Los Angeles/LAX to Ontario International Airport, with stations at Union Station in downtown Los Angeles and West Covina. Further extensions to be completed by 2035 include an extension to San Bernardino, a potential Anaheim to Ontario line, and a freight spur connecting the San Pedro ports to the IOS. Neither the exact alignment of the HSRT routes nor the location of the stations has been finalized. In total, the proposed HSRT route in 2035 would be approximately 276 miles, some of which could traverse through prime agricultural lands and grazing lands. However, the final alignment is expected to follow existing transportation right-of-way, thus minimizing adverse effects on agricultural lands. The HSRT system would have approximately fourteen stations and would also require land for maintenance and power generation of its approximately fourteen stations. The location of the stations and other facilities associated with operating the HSRT system potentially would consume or disturb agricultural land.

Additional agricultural lands would be affected by the growth associated with the 2008 RTP. The effect of growth and urban development on agricultural lands is addressed in the Cumulative Impacts section of this chapter.

The loss and disturbance of agricultural lands would be **significant**.

Mitigation Measures

MM-OS.1: 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-OS.2: For projects in agricultural areas, project implementation agencies shall 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 shall be evaluated in project-specific environmental documents. The analysis shall use the land evaluation and site assessment (LESA) analysis method (CEQA Guidelines §21095), as appropriate. The project implementation agencies or local jurisdictions shall 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-OS.3 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-OS.4: Project implementation agencies shall 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-OS.5: Prior to final approval of each project and when feasible and prudent, the implementing agency shall establish conservation easement programs to mitigate impacts to prime farmland.

MM-OS.6: Prior to final approval of each project, the implementing agency shall 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-OS.7: Prior to final approval of each project, the implementing agency shall encourage enrollments of agricultural lands for counties that have Williamson Act programs, where applicable.

MM.OS-8 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-OS.9: SCAG shall use its IGR process to review projects with potentially significant impacts to important farmlands and recommend impact avoidance and mitigation measures.

MM-OS.10: 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-OS.11: Development and local governments should submit for IGR review projects with potentially significant impacts to important farmlands. Project should include mitigation measures to reduce impacts and demonstrate project alternatives that avoid or lessen impact to agricultural lands. Mitigation should occur at a 1:1 ratio.

Significance after Mitigation

It is anticipated that impacts to agricultural land would not be able to be mitigated in every instance. Therefore, this impact would remain **significant**.

Impact 3.10-2: Implementation of the projects included in the 2008 RTP would result in a substantial loss or disturbance of existing open space and recreation lands.

The 2008 RTP includes projects that would require the acquisition or development of previously undisturbed/vacant or designated open space potentially resulting in a significant impact.

Map 3.10-1 Existing Open Space, Recreation and Agricultural Land Uses and **Map 3.10-4** Open Space Resources show the location of open space throughout the region. 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. Some open spaces also provide critical habitat, as discussed in Chapter 3.3 Biological Resources. Where new transportation facilities would be constructed it is possible that impacts could occur to open spaces, either through the

acquisition of land or through development of previously undisturbed/vacant land that is currently considered open space.

Transit improvements included in the 2008 RTP 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. However, several other types of projects identified in the 2008 RTP would have the potential to create a significant impact open space. 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 open space or agricultural lands. Corridor projects in particular would be expected to result in impacts to open spaces due to large 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. These include projects that would be expected to include substantial widening to accommodate large increases in traffic, such as the High Desert Corridor and projects such as SR-241 that are located in areas designated as open space would be expected to result in significant impacts.

In addition, the 2008 RTP includes arterial investments, goods movement capacity enhancements, and the HSRT system, which were not included in the GIS analysis summarized above. The alignments of these improvements have not been developed to the point that they can be reliably overlaid onto open space and recreation lands using GIS. However, these projects would potentially cause additional adverse effects on open space and recreation lands.

As with agricultural lands, SCAG used GIS to analyze where major freeway, rail, and transit projects in the 2008 RTP intersect areas designated for open space and recreation lands. A 300-foot buffer (150 feet on either side) was drawn around the freeway, rail, and transit projects in the 2008 RTP to compute the number of open space and recreation lands potentially affected by the projects in the 2008 RTP. The results of this analysis (Maps 3.10-1 and 3.10-5) show that the 2008 RTP would directly affect approximately 800 acres of open space and recreation lands. Additional open space lands would be affected by the growth associated with the 2008 RTP. The effect of growth and urban development on agricultural lands is addressed in the Cumulative Impacts section of this chapter.

The loss and disturbance of open space and recreation lands would be **significant**.

Mitigation Measures

MM-OS.12: Project implementation agencies shall ensure that projects are consistent with federal, state, and local plans that preserve open space.

MM-OS.13: Project implementation agencies shall 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-OS.14: Project implementation agencies shall 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-OS-15: Prior to final approval of each project, the implementing agency shall 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 implementation agencies or local jurisdiction shall be responsible for ensuring adherence to the mitigation measures prior to construction.

MM-OS.16: For projects that require approval or funding by the USDOT, project implementation agencies shall comply with Section 4(f) of the USDOT Act.

MM-OS.17: 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-OS.18: SCAG shall establish criteria for evaluating impacts to regionally significant open space resources, and will recommend mitigation measures for significant impacts to regional resources. These recommendations will be included in SCAG's Regional Open Space Guidance.

MM-OS.19: SCAG shall develop and implement coordinated mitigation programs for regional projects, with an emphasis on regional transportation projects.

MM-OS.20: SCAG shall produce and maintain a list/map of potential conservation opportunity areas. These conservation opportunity areas may be used by local governments and project sponsors as priority areas for mitigating impacts to open space resources. SCAG's forthcoming regional open space guidance document will include additional information on conservation opportunity areas.

MM-OS.21: SCAG shall use its IGR process to review projects with potentially significant impacts to open space and recommend impact avoidance and mitigation measures.

MM-OS.22: Project sponsors should ensure that transportation systems proposed in the RTP 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-OS.23: Project sponsors 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 growth that accompanies transportation projects/improvements.

MM-OS.24: Individual projects submitted for IGR review 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 shall demonstrate consideration of alternatives that would avoid or reduce impacts to open space.

MM-OS.25: Individual projects 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, and Ventura County Mitigation Guidelines.

Significance after Mitigation

It is anticipated that impacts to open space and recreational lands would not be able to be mitigated in every instance. Therefore, this impact would remain **significant**.

Impact 3.10-3 Implementation of the 2008 RTP could increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facilities would occur; or could result in a decrease in performance objectives for existing parks.

Implementation of the 2008 RTP would affect population and households in the region. Chapter 3.11 Population, Housing and Employment includes a discussion of the growth inducing impacts associated with the 2008 RTP. The total population is expected to increase by approximately 5.14 million for the Plan (and each alternative). Although the overall regional estimates of population would not change, the RTP includes projects, programs and strategies that would induce growth in certain areas of the region. As a result of increased population growth certain areas could experience increased use and deterioration of existing neighborhood and regional parks. As discussed under impact 3.10-2 above, the 2008 RTP also includes projects that could result in the acquisition of public lands currently used for open space purposes, resulting increased use at remaining facilities. Figure 3.10-9 indicates that many parts of the region currently have parks-to-people ratios below the NRPAA standards. Further reductions in the ratio of parks-to-people, through the loss of existing parkland or through an increase in population that outpaces open space availability would be a significant impact.

Mitigation Measures

MM-OS.26: SCAG, in collaboration with its member agencies, shall work to enhance community open space and its accessibility.

MM-OS.27: 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-OS.28: 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-OS.29: 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.

MM-OS.30: 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 shall encourage joint use of utility, transportation and other rights-of-way, greenbelts, and biodiversity areas

MM-OS.31: Local governments should prepare a Needs Assessment to determine the level of adequate community open space level for their areas.

MM-OS.32: Local governments should encourage patterns of urban development and land use, which reduce costs on infrastructure and make better use of existing facilities.

Significance after Mitigation

Even with mitigation, implementation of the 2008 RTP would induce population in areas that are currently underserved by recreational facilities. This impact would remain **significant**.

Cumulative Impact 3.10-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth patterns contributes to regional cumulatively considerable impacts to open space and result in a loss of open space and agricultural lands in the region.

The construction and operation of the transportation projects in the 2008 RTP would affect a number of land uses, including open space and agricultural lands. **Table 3.10-5** shows the estimated acreage of different land use categories that occur within 150 feet of either side of the reasonably foreseeable transportation alignments included in the Plan and the No Project Alternative. The land uses affected by the No Project Alternative are discussed in the Comparison with the No Project section of this chapter.

TABLE 3.10-5
LAND USES WITHIN 150 FEET OF MAJOR HIGHWAY, TRANSIT, AND FREIGHT RAIL PROJECTS IN THE 2008 RTP

Land Use	Plan Approximate Acres Affected	No Project Alternative Approximate Acres Affected
Commercial	4,600	4,700
Extraction	200	40
Grazing Land	7,000	2,000
Industrial	3,000	1,000
Low Density Residential	500	100
Medium to High Residential	5,700	2,400
Open Space and Recreation	800	300
Prime Farmland	850	400
Public Facilities and Institutions	1100	1,000
Rural Density Residential	267	40
Transportation and Utilities	10,800	6,700
Vacant	11,700	3,200
Water and Floodways	60	10

SOURCE: SCAG GIS Analysis, 2007, SCAG Land Use, 2005.

In addition to these direct impacts on land use, **Table 3.10-6** indicates the total acreage of open space and vacant land that would be expected to be consumed due to urbanization of the region with the 2008 RTP. As indicated in **Table 3.10-5** the 2008 RTP could directly impact up to 7,000 acres of grazing land, up to 850 acres of prime farmland, up to 800 acres of open space and up to 11,700 acres of vacant land. The total amount of urbanized acres (either vacant, open space or agricultural) that is anticipated to be affected by growth between now and 2035 would be approximately 200,000 acres under the Plan (see **Table 3.10-6**).

TABLE 3.10-6
LAND USE CONSUMPTION (AREA IN ACRES)

Sum Of Area (Acres)		2008 RTP		
County	**Lu2005 (Revised)**	**Impacted**	**Urban**	**Grand Total**
Imperial	Agriculture	2,440	3,863	6,304
	Open Space and Recreation	0	200	200
	Vacant	947	3,149	4,095
Imperial Total		**3,387**	**7,212**	**10,599**
Los Angeles	Agriculture	56	939	995
	Open Space and Recreation	246	2,518	2,764
	Vacant	7,779	20,702	28,481
Los Angeles Total		**8,081**	**24,159**	**32,240**
Orange	Agriculture	0	1,331	1,331
	Open Space and Recreation	0	496	496
	Vacant	0	2,850	2,850
Orange Total		**0**	**4,677**	**4,677**

TABLE 3.10-6 (Continued)
LAND USE CONSUMPTION (AREA IN ACRES)

Sum Of Area (Acres)		2008 RTP		
County	**Lu2005 (Revised)**	**Impacted**	**Urban**	**Grand Total**
Riverside	Agriculture	22,722	6,589	29,311
	Open Space and Recreation	2,651	2,446	5,097
	Vacant	43,830	25,720	69,550
Riverside Total		**69,202**	**34,755**	**103,958**
San Bernardino	Agriculture	34	6,929	6,963
	Open Space and Recreation	40	1,748	1,788
	Vacant	2,074	35,319	37,393
San Bernardino Total		**2,147**	**43,996**	**46,143**
Ventura	Agriculture	36	2,060	2,096
	Open Space and Recreation	62	697	759
	Vacant	184	3,762	3,946
Ventura Total		**282**	**6,519**	**6,801**
Grand Total		**83,099**	**121,319**	**204,419**

SOURCE: SCAG GIS Analysis, 2007, SCAG Land Use, 2005.

The 2008 RTP includes policies that would influence the distribution of the growing population. The land use measures included in the 2008 RTP would encourage use of underutilized land (land built at a density less than permitted by general plans), 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 strategies and policies included in the 2008 RTP could result in changes in land uses by changing concentrations of development throughout the six-county region.

The contribution of the 2008 RTP to impacts on existing land use would be cumulatively significant, as it would result in changes to existing land use, including prime farmlands, grazing lands, and open space and recreational lands.

Mitigation Measures

The Mitigation measures listed above for impacts 3.10-1 through 3.10-3 shall be applied to Tier 2 projects (General and Specific plans and individual development projects) in the region. In addition to these measures, the following mitigation measures would be applied to Tier 2 and 3 projects (General and Specific plans and individual development projects) in the SCAG Region.

MM.OS-33: 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.OS.34: Project level mitigation for significant cumulative and growth-inducing impacts on open space resources will include but not be limited to the conservation of natural lands, community open space and important farmland through existing programs in the region or through multi-party conservation compacts facilitated by SCAG.

MM-OS.35: Local governments should establish transfer of development rights (TDR) programs to direct growth to less agriculturally valuable lands (while considering the potential effects at the sites receiving the transfer) and ensure the continued protection of the most agriculturally valuable land within each county through the purchase of the development rights for these lands. Local governments should also consider the following:

- 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-OS.36: Local governments 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 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-OS.37: 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-OS.38: SCAG shall consider consistency with ongoing regional open space planning in funding opportunities and programs administered by SCAG.

MM-OS.39: Local governments 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-OS.40: Local governments should encourage patterns of urban development and land use, which reduce costs on infrastructure and make better use of existing facilities. Strategies local governments 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-OS.41: Project sponsors and local governments should increase the accessibility to natural areas lands for outdoor recreation.

MM-OS.42: Project sponsors and local governments should promote infill development and redevelopment to revitalize existing communities.

MM-OS.43: Project sponsors should incorporate and local governments should include land use principles, such as green building, that use resources efficiently, eliminate pollution and significantly reduce waste into their projects, zoning codes and other implementation mechanisms

MM-OS.44: Project sponsors and local governments should promote water-efficient land use and development.

MM-OS.45: Project sponsors and local governments 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.

Significance after Mitigation

In order to accommodate the anticipated growth in the region by 2035, substantial changes in vacant, agricultural and open space lands will occur. The cumulative impact would remain **significant**.

Comparison with the No Project Alternative

Under the No Project alternative the population of the SCAG region would grow by 5.14 million people, however no regional transportation investments would be made above the existing programmed projects.

Direct Impacts

The No Project Alternative includes fewer transportation projects than the 2008 RTP. Thus, the No Project Alternative would be expected to directly consume or disturb fewer acres of agricultural lands and open space than the Plan Alternative. The No Project Alternative potentially would affect 400 acres of prime agricultural land and 2,000 acres of grazing land, compared with 850 acres of prime agricultural land and 7,000 acres of grazing land under the Plan Alternative. The open space that would be affected under the No Project Alternative would 300 acres, compared with 800 acres of open space in the Plan Alternative.

The Plan would have a greater impact than the No Project Alternative for Impacts 3.10-1 through 3.10-3.

Indirect Impacts

The No Project Alternative is expected to accommodate the same increase in total population as the proposed Plan Alternative. However, the Plan Alternative 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 (although individual jurisdictions are likely to adopt some of the Compass growth strategies independently of the RTP). **Table 3.10-7** indicates that under the No Project Alternative, up to approximately 655,000 acres of vacant, open space and agricultural lands would be consumed, compared to 200,000 under the Plan.

TABLE 3.10-7
NO PROJECT LAND USE (AREA IN ACRES)

	(Acres)		2008 RTP	
County	**Land Use 2005 (Revised)**	**Impacted**	**Urban**	**Grand Total**
Imperial	Agriculture	5,617	5,413	11,030
	Open Space and Recreation	71	190	261
	Vacant	2,369	3,526	5,895
Imperial Total		**8,057**	**9,129**	**17,186**
Los Angeles	Agriculture	1,551	2,277	3,828
	Open Space and Recreation	946	2,896	3,842
	Vacant	50,389	44,927	95,316
Los Angeles Total		**52,886**	**50,100**	**102,986**
Orange	Agriculture	280	2,023	2,303
	Open Space and Recreation	562	1,121	1,683
	Vacant	3,282	7,147	10,429
Orange Total		**4,124**	**10,291**	**14,414**
Riverside	Agriculture	15,770	23,112	38,882
	Open Space and Recreation	2,881	6,086	8,967
	Vacant	87,593	145,835	233,428
Riverside Total		**106,244**	**175,033**	**281,277**
San Bernardino	Agriculture	2,841	4,891	7,733
	Open Space and Recreation	920	1,385	2,306
	Vacant	134,820	85,097	219,917
San Bernardino Total		**138,581**	**91,374**	**229,955**
Ventura	Agriculture	245	1,130	1,375
	Open Space and Recreation	398	387	785
	Vacant	4,150	3,023	7,173
Ventura Total		**4,793**	**4,540**	**9,332**
Grand Total		**314,684**	**340,467**	**655,152**

SOURCE: SCAG 2007

The proposed 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. This improved accessibility under the Plan Alternative would help facilitate population and economic growth in areas of the region that are currently not developed. However, land use policies would seek to strictly limit development outside targeted areas.

The No Project Alternative is expected to accommodate the same increase in total population as the proposed Plan Alternative. However, the Plan Alternative 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. Without coordinated regional growth strategies, outlying areas could continue to be developed due to inexpensive land prices. These areas would likely include agricultural lands and open spaces or lands adjacent to agricultural lands and open spaces. The total vacant land consumed under the Plan would be less than under the No Project.

The Plan Alternative's cumulative impacts to land use would be less than those of the No Project Alternative.

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3.11 Population, Housing, and Employment

This section describes the current population, housing, and employment of the SCAG region, identifies potential impacts of the 2008 RTP on these three factors, includes mitigation measures for the impacts, and evaluates the residual impacts. The data used in this chapter represents SCAG's most reliable available data for population, housing and employment information.

Environmental Setting

The SCAG region is the second most populous metropolitan region in the nation. The U.S. Census reported the 2000 population of the SCAG region was 16,516,006. The California State Department of Finance estimates that the population of the region has since reached 18,909,603. Over six percent of the national population lives in the SCAG region, and for over half a century the region has been home to half the population of California. **Table 3.11-1** shows the total population of the region, by decade, and the region's percentage of the total U.S. and California populations.

TABLE 3.11-1
SCAG POPULATION AND SHARE OF U.S. AND CALIFORNIA POPULATIONS, 1900-2008

Year	Population	Share of U.S. Pop.	Share of CA Pop.
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%
2007	18,487,882	6.3%[1]	49.7%[2]
2008	18,909,603	6.2%[1]	50.2%[2]

SOURCE: 1900-2000 U.S. Decennial Census. State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2007, with 2000 Benchmark. Sacramento, California, May 2007.*

1 : The SCAG region's 2007 and 2008 share of the United States population may be overestimated due to the generally higher estimate of Department of Finance data compared to the U.S. Census.

The SCAG region gained almost 1.9 million people between 1990 and 2000, and the California Department of Finance estimates that the region has added yet another 2.4 million since 2000. The Inland Empire saw significant growth between 2000 and 2008, with Riverside County increasing 27 percent to 2.12 million, and San Bernardino County increasing 22.7 percent to reach 2.097 million during the same time. Meanwhile, Orange County increased 12.8 percent, and reached a population of 3.21 million. Although Los Angeles has had the slowest growth rate of all the SCAG counties, it has seen the most people added to its population, adding nearly one million people between 2000 and 2008 to reach a county population of 10.4 million. **Table 3.11-2**

shows population figures for the SCAG counties in 1990, 2000, and 2008, as well as the absolute population increases between those years and the annual average percent change in population.

TABLE 3.11-2
POPULATION GROWTH FOR SCAG COUNTIES, 1990 – 2008

County	1990 Total Population	2000 Total Population	2008 Population	1990-2008 Pop. change	1990-2008 Annual Average % Change
Imperial	109,303	142,361	187,001	77,698	3.90%
Los Angeles	8,863,164	9,519,338	10,451,734	1,588,570	0.99%
Orange	2,410,556	2,846,289	3,212,949	802,393	1.85%
Riverside	1,170,413	1,545,387	2,118,178	947,765	4.50%
San	1,418,380	1,709,434	2,097,756	679,376	2.66%
Ventura	669,016	753,197	841,985	172,969	1.44%
SCAG	14,640,832	16,516,006	18,909,603	4,268,771	1.62%

SOURCE: 1990 and 2000 Decennial Census. State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2007, with 2000 Benchmark. Sacramento, California, May 2007.* Southern California Association of Governments, 2008 population growth estimates.

Ethnic Composition

The population of the SCAG region is extremely diverse, as of July 2007 there is no racial or ethnic majority in the region. The rise and shift in population make-up in Southern California in the last few years has been due to an increase of Hispanic and Asian populations relative to white and black populations. Increasing birth rates among Hispanics rather than an influx of new immigrants caused much of the increase. Region-wide population changes between 13 percent and 22 percent occurred in every ethnic group except for non-Hispanic whites and non-Hispanic blacks, which saw changes of 0.45% and -ve1.4 percent, respectively. A Hispanic population plurality is currently 43 percent due to population increases of this ethnic group. The next largest non-Hispanic groups in the SCAG region are a decreasing white population with 36.6 percent, non-Hispanic Asian at 11 percent, and non-Hispanic black at 6.7 percent. Table **3.11-3** examines the changing ethnic populations in the SCAG region between 2000 and 2004.

Age Distribution

The region shows an aging pattern of population growth between 2000 and 2007. The baby-boom population in the SCAG region is aging, and many are starting to retire. As a result, the percentage of people considered the working age population (ages 20-64) decreased between 1990 and 2000, although it saw a small increase between 2000 and 2007 **(Table 3.11-4)**. The share of the population over age 65 has increased overall, having remained the same or increased in every SCAG county except Riverside. The share of the population over 65 is expected to grow as more and more baby boomers reach retirement age. With large absolute growth of dependent age population, there will be even greater demand for services such as health care, and for access via alternative mobility sources such as public transit.

TABLE 3.11-3
ETHNIC COMPOSITION COMPARISON FOR SCAG COUNTIES, 2000-2004

County	Year	Hispanic	Non-Hispanic White	Non-Hispanic Black	Non-Hispanic American Indian	Non-Hispanic Asian	Non-Hispanic Pacific Islander	Non-Hispanic Multirace
Imperial	2000	103,523	29,767	5,209	1,783	2,517	77	721
	2004	117,579	30,951	5,284	1,964	2,570	81	902
	% change	13.5%	4.0%	1.4%	10.2%	2.1%	5.2%	25.1%
Los Angeles	2000	4,273,822	3,041,730	913,186	27,310	1,158,511	24,545	139,317
	2004	4,692,011	3,037,170	880,044	29,463	1,289,934	27,455	174,590
	% change	9.8%	-0.15%	-3.6%	7.9%	11.3%	11.9%	25.3%
Orange	2000	885,948	1,476,015	43,119	8,662	394,027	8,696	47,061
	2004	1,000,329	1,455,447	39,166	10,495	462,716	10,501	57,348
	% change	12.9%	-1.4%	-9.2%	21.2%	17.4%	20.8%	21.9%
Riverside	2000	571,553	793,272	93,540	10,338	60,514	3,355	26,499
	2004	746,399	858,731	99,189	12,531	96,175	3,973	32,845
	% change	30.6%	8.3%	6.0%	21.2%	58.9%	18.4%	24.0%
San Bernardino	2000	687,260	757,019	155,347	10,206	81,828	4,533	26,588
	2004	864,112	749,026	170,802	11,762	98,008	5,199	27,647
	% change	25.7%	-1.1%	10.0%	15.3%	19.8%	14.7%	4.0%
Ventura	2000	253,533	433,039	13,686	3,259	41,665	1,421	12,051
	2004	294,310	428,654	12,432	3,664	55,024	1,528	12,813
	% change	16.1%	-1.0%	-9.2%	12.4%	32.1%	7.5%	6.3%
SCAG Region	2000	6,775,639	6,530,842	1,224,087	61,558	1,739,062	42,627	252,237
	2004	7,714,740	6,559,979	1,206,917	69,879	2,004,427	48,737	306,145
	% change	13.9%	0.45%	-1.4%	13.5%	15.3%	14.3%	21.4%

SOURCE: State of California Department of Finance, Demographic Research Unit. E3: California County Race/Ethnic Population Estimates, July 1, 2000-2004.

TABLE 3.11-4
AGE DISTRIBUTION OF THE SCAG COUNTIES, 2000-2007

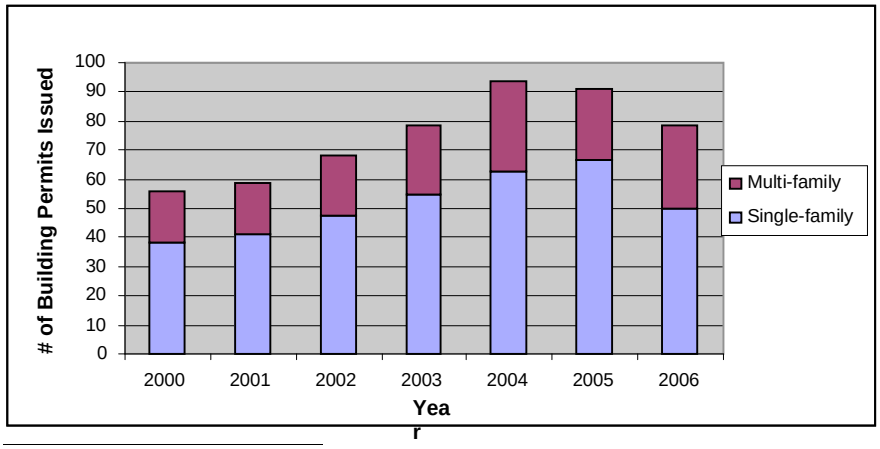
County	Age Category	% 2000 Population	% 2007 Population
Imperial	Under 19	34.4	31.0
	Age 20-64	55.5	58.7
	Over 65	10.1	10.3
Los Angeles	Under 19	31.0	30.2
	Age 20-64	59.2	59.0
	Over 65	9.8	10.8
Orange	Under 19	29.7	28.6
	Age 20-64	60.5	61.0
	Over 65	9.8	10.5
Riverside	Under 19	33.3	32.4
	Age 20-64	54.1	57.0
	Over 65	12.6	10.6
San Bernardino	Under 19	34.5	33.1
	Age 20-64	56.1	58.4
	Over 65	8.5	8.5
Ventura	Under 19	31.2	29.1
	Age 20-64	58.6	60.0
	Over 65	10.2	10.9
SCAG Region	Under 19	31.5	30.5
	Age 20-64	58.6	59.1
	Over 65	9.9	10.4

SOURCE: State of California, Department of Finance, *Race/Ethnic Population with Age and Sex Detail, 2000–2050.* Sacramento, CA, July 2007.

Housing

Figure 3.11-1 depicts building permits in the SCAG region and **Table 3.11-5** shows households in the SCAG region. The California Department of Finance estimates there were about 6.1 million housing units in the region in 2007, an increase of more than 400,000 units since 2000. Residential housing permit issuance in the region has been increasing for over a decade through 2004, but has declined slightly since then. From 2000 to 2006, multi-family housing development increased by nearly 60 percent while single-family housing development increased by 30 percent.

FIGURE 3.11-1
RESIDENTIAL BUILDING PERMITS IN SCAG REGION, 2000-2006



SOURCE: Construction Industry Research Board

TABLE 3.11-5
HOUSEHOLDS IN THE SCAG REGION

County	2008
Imperial	52,323
Los Angeles	3,299,573
Orange	1,015,906
Riverside	677,256
San Bernardino	612,859
Ventura	269,066
Region	5,926,983

SOURCE: Southern California Association of Governments, 2008 Household estimates

During the 1990s, vacant units decreased as building permit issuance lagged population and household growth. Vacancy rates dropped to severe deficit levels in most of the urban areas of the region, while housing inventories were high predominantly in outer urbanizing areas. Between 2000 and 2005, vacancy rates have continued to drop for the most part despite increases in building permit issuance. Rental rate vacancies have increased only in Los Angeles and Orange counties (**Table 3.11-6)**. As the region's housing stock continues to age, it becomes crucial for more communities to prioritize the reinvestment, re-use, and preservation of buildings.

TABLE 3.11-6
OWNER AND RENTAL VACANCY RATES IN THE SCAG COUNTIES, 2000 AND 2005

County	Owner Vacancy Rate		Rental Vacancy Rate	
	2000	2005	2000	2005
Imperial	1.4	1.3	4.9	2.6
Los Angeles	1.6	0.8	3.3	3.5
Orange	0.9	0.9	3.0	3.8
Riverside	2.5	1.4	7.2	5.0
San Bernardino	3.1	1.7	7.3	4.5
Ventura	0.9	0.7	2.8	3.6

SOURCE: U.S. Census Bureau, Census 2000 Summary File 3; U.S. Census Bureau, 2005 American Community Survey.

Homeownership and Housing Affordability

Homeownership rates increased in all counties of the region between 2000 and 2005 **(Table 3.11-7).** Only in Los Angeles County is the homeownership rate lower than the California statewide average of 58.4 percent, while Riverside and Ventura counties are the only ones in the SCAG region to exceed the national average of 66.9 percent. Among the ten largest U.S. metropolitan regions, Southern California ranks only behind the New York region in terms of homeownership rate.

TABLE 3.11-7
HOMEOWNERSHIP RATES

	1990	2000	2005
Imperial	57.6%	45.1%	57.9%
Los Angeles	48.2%	41.1%	49.1%
Orange	60.1%	52.4%	62.0%
Riverside	67.4%	55.5%	69.7%
San Bernardino	63.3%	56.1%	65.1%
Ventura	65.5%	58.6%	68.9%
California	53.8%	48.1%	58.4%
United States	63.9%	52.3%	66.9%

SOURCE: U.S. Census Bureau, Census 2000 Summary File 3; U.S. Census Bureau, 2005 American Community Survey.

Despite increases in the homeownership rate, housing affordability declined dramatically since 2000. The percentage of Southern California households that can afford to buy a median-priced home varies by county, but remains far below the national rate, and affordability remains mostly below the statewide rate as well **(Table 3.11-8)**.

Household Size

As population has increased the number of new housing units has not kept, leading to an increase in average household size to 3.19 by 2007. The increase in household size contrasts with the steady U.S. average household size of 2.60, (2005, up from 2.59 in 2000). **Table 3.11-9** displays the average household size for the counties in the region and for the SCAG region overall.

TABLE 3.11-8
AFFORDABILITY INDEX (PERCENTAGE OF HOUSEHOLDS WHO CAN AFFORD TO PURCHASE MEDIAN-PRICED HOME)

	1990	2000	2005
United States	51%	53%	50%
California: Detached Homes	23%	31%	16%
Condominiums	37%	44%	23%
Los Angeles	19%	35%	14%
Orange	22%	27%	11%
Riverside/San Bernardino	37%	48%	18%
Ventura	20%	31%	13%

SOURCE: California Association of Realtors.
Note: Data for Imperial County unavailable.

TABLE 3.11-9
HOUSEHOLD SIZE

	1990	2000	2007
Imperial	3.26	3.42	3.28
Los Angeles	2.91	3.14	3.13
Orange	2.87	3.06	3.09
Riverside	2.85	3.09	3.05
San Bernardino	2.97	3.17	3.31
Ventura	3.02	3.11	3.06
SCAG Region	2.98	3.16	3.19

SOURCE: 1990 and 2000 U.S. Decennial Census. State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2007, with 2000 Benchmark. Sacramento, California, May 2007*.

Employment

The SCAG region has almost 7.3 million jobs and has an economy that would rank as the world's tenth largest economy. The region has a diversified economic base centered upon the largest port complex in the country, the nation's largest entertainment and tourism sector, the country's largest diversified manufacturing center, and participates in fast-growing and high paying professional services, biotechnology, and design markets. Trade and goods movement, both waterborne and airborne, have been important engines of economic growth and change. Freight and industrial corridor development to support the transportation of goods has become an increasingly important feature of the regional economy that has been supported by an inland valley boom in industrial and warehouse growth. In the past few years, the Inland Empire (Riverside and San Bernardino Counties) has led the state and region in job and housing growth.

During the 1990s, the region lost manufacturing jobs, particularly in aerospace, and gained jobs in the international trade, imports, and service sectors, particularly high paying new economy jobs and low paying restaurant and retail employment. Business services, direct international trade services, tourism, health services, motion pictures/television production, apparel and textile industries together grew by more than 500,000 jobs during the decade. Small and medium-size

companies created the majority of these jobs. The region experienced a net loss of 500,000 jobs during the recession period between 1990 and 1993, and then overcame the recession by adding 780,000 jobs between 1996 and 2000. After slow growth in jobs in 2002 and 2003, the region is regaining its economic strength by increasing new annual job growth beyond these early decade levels. **Table 3.11-10** shows employment figures for the SCAG region and each county.

TABLE 3.11-10
TOTAL EMPLOYMENT

	1990	2000	2008
Imperial	44,900	50,400	67,130
Los Angeles	4,149,500	4,079,800	4,490,248
Orange	1,179,000	1,396,500	1,699,475
Riverside/ San Bernardino	735,200	1,010,100	1,498,958
Ventura	247,000	294,300	362,209
SCAG Region	6,355,600	6,831,100	8,118,019

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.* Southern California Association of Governments, 2008 population growth estimates.

Unemployment

The 2006 unemployment rate for the SCAG region was 4.6%. This was equal to the national average, and slightly lower than the statewide rate of 4.9%. Unemployment rates across the board have lowered from 1990 and 2000 rates. Imperial County's unemployment rate remains the highest in the state. **Table 3.11-11** shows the unemployment rate in the SCAG region.

TABLE 3.11-11
UNEMPLOYMENT RATE IN THE SCAG REGION

	1990	2000	2006
Imperial	24.6%	15.8%	15.3%
Los Angeles	5.8%	5.4%	4.7%
Orange	3.5%	3.5%	3.4%
Riverside	7.2%	5.4%	5%
San Bernardino	5.6%	4.8%	4.7%
Ventura	5.7%	4.5%	4.3%
SCAG Region	5.6%	4.9%	4.6%

SOURCE: State of California, Employment Development Department, Labor Market Information Division, *Monthly Labor Force Data for Counties, Annual Average, 2006 Benchmark, March 2, 2007.*

Regulatory Setting

Location of population, housing and employment follow land use regulations, see Section 3.8.

Methodology

Comparison with the No Project

The analysis of population, housing, and employment includes a comparison of the expected future conditions with 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 (which is based on a comparison to existing conditions); however it provides a meaningful perspective on the effects of the 2008 RTP.

Determination of Significance

The methodology for determining the significance of these impacts compares the existing conditions to the future Plan 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 Plan.

Each alternative, including the Plan, consists of transportation policies, objectives and investments and land use-transportation measures (see Chapter 2.0 Project Description for the Plan’s policies, objectives, investments and land-use-transportation measures). For each alternative, differing sets of policies, objectives and investments were applied to the No Project growth projection. This projection indicates the population, household, and employment distribution that could be expected without implementation of the 2008 RTP. The 2035 growth projection for each alternative are held constant at the regional level for population, employment and households, but differ from one another in distribution of people, households and jobs.

The alternatives differ in terms of the distribution of people, households and jobs. These differing population distributions were generated by applying the transportation policies and investments, and land use-transportation measures to the No Project growth projection (the projection of what would be expected to occur in 2035 without intervention of these policies and investments). Changes in investments and policies would shift the population distribution expected in 2035, as a function of changes in mobility and land use decisions. In this way, each RTP alternative is associated with a different projection of population, households, and employment distribution.

Projects in the proposed Plan 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.

These evaluations are based on general descriptions of projects in the proposed Plan and are regional and programmatic in nature. This section is intended to serve as a starting point for local jurisdictions in the preparation of project specific environmental documentation and any necessary mitigation measures.

Significance Criteria

The proposed Plan would have a significant impact if implementation would:

- Induce substantial population growth to areas of the region;
- Require the acquisition of right-of ways, which displaced a substantial number of existing businesses or homes;
- Separate residences from community facilities and services, restrict access to commercial or residential areas, or eliminate community amenities.

Impacts and Mitigation Measures

Implementation of the 2008 RTP would affect population, households, and employment. Expected significant impacts include substantial induced population growth in areas of the region, 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 land.

Both short-term construction related impacts and long-term or permanent displacement as well as offsite impacts from new facilities would occur as a result of implementation of the 2008 RTP. Indirect impacts due to the changes in population distribution expected to occur due to the 2008 RTP's transportation investments and transportation and land use policies are also identified.

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.

Impact 3.11-1: Implementation of the 2008 RTP could facilitate substantial population growth to some areas of the region.

The CEQA statute and *CEQA Guidelines* require "growth-inducing" impacts to be identified. 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 Plan.

As discussed in Chapter 2.0 Project Description, each Alternative, including the Plan, is associated with the same 2035 growth projection, but with variations in distribution among counties between alternatives. This growth projection represents the expected amount and distribution of people, households, and jobs that would occur in 2035 if the policies and investments included in each Alternative were implemented. Without implementation of policies and investments the No Project growth projection would be expected to occur by 2035. As discussed above, the total population is expected to increase by approximately 5.14 million for the Plan and each alternative. The population, households, and employment expected in 2035 with implementation of the proposed Plan are provided in **Table 3.11-12.** The data are provided by county in order to illustrate the effects of the Plan on population, households and employment distribution.

TABLE 3.11-12:
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	320,446	314,104	103,000	101,000	133,000	132,000
Los Angeles	12,337,576	12,588,277	4,003,000	4,087,000	5,041,000	5,091,000
Orange	3,653,988	3,699,211	1,118,000	1,134,000	1,982,000	1,991,000
Riverside	3,596,681	3,472,034	1,183,000	1,142,000	1,414,000	1,387,000
San Bernardino	3,133,799	2,957,370	973,000	914,000	1,255,000	1,220,000
Ventura	1,013,756	1,025,250	330,000	334,000	463,000	466,000
SCAG Region	24,056,246	24,056,246	7,710,000	7,710,000	10,287,000	10,287,000

SOURCE: Southern California Association of Governments, 2008 population growth estimates.

As discussed above, the region is expected to add an additional 5.14 million people, 1.8 million households and 2.17 million jobs between 2008 and 2035. Implementation of the 2008 RTP would result in the same regional totals as the No Project alternative; however, implementation of the 2008 RTP would result in different distributions of population, households and employment than under the No Project. The transportation investments and urban form strategies in the proposed Plan 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 Plan could help facilitate population and economic growth to areas of the region that are currently not developed. Thus, implementation of the proposed Plan could result in a significant growth inducing effect in some areas of the region.

The indirect adverse effects of this growth on the physical environment are evaluated in the cumulative impacts section of the land use section and other impact discussions throughout this PEIR.

Growth inducing impacts could be **significant.**

Mitigation Measures

MM-POP.1: SCAG shall work with its member agencies to implement growth strategies to create an urban form designed to utilize the existing transportation networks and the transportation improvements contained in the 2008 RTP, enhancing mobility and reducing land consumption.

Significance after Mitigation

The policies included in the Plan seek to direct growth in a way that is efficient for both mobility and land consumption. However, implementation of the Plan would help distribute growth to certain vacant areas of the region. Thus, the impact would remain **significant**.

Impact 3.11-2: Implementation of the 2008 RTP projects could require the acquisition of rights-of-way that could displace a substantial number of existing homes and businesses.

Development of highway, arterial and transit projects proposed under the 2008 RTP could result in the disturbance and/or loss of land currently used for residential and business uses. The 2008 RTP 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 or business purposes. In addition to freeway and transit projects, the RTP includes roadways dedicated to goods movement that would be located in Los Angeles, Orange, Riverside and San Bernardino Counties, beginning at the Ports of Long Beach and Los Angeles and traveling I-710 north and then east on SR-60, I-10, or other possible alignments, to I-15 and then north on I-15 to Barstow. These facilities, depending on the alignment, potentially would traverse through lands currently used for residential and business purposes. The final alignment likely would be adjacent to or concurrent with existing alignments, thus the adverse effects on displacing homes and businesses would be minimized.

The proposed HSRT system includes segments in Los Angeles, Orange, Riverside and San Bernardino Counties by 2035. The initial operating segment (IOS) of the HSRT system, as currently planned, would run from West Los Angeles/LAX to Ontario International Airport, with stations at Union Station in downtown Los Angeles and West Covina. Further extensions to be completed by 2035 include an extension to San Bernardino, a potential Anaheim to Ontario line, a freight spur connecting the San Pedro ports to the IOS, and the Orangeline from Irvine to Palmdale. Neither the exact alignment of the HSRT routes nor the location of the stations has been finalized. Provided that the system runs on an elevated track as currently projected, the removal of homes would be minimized. However, the location of the stations and other facilities associated with operating the HSRT system could displace homes and businesses.

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 and business uses. A 150-foot potential impact zone was drawn around the freeway, rail, and transit projects in the 2008 RTP to

compute the number of acres that could potentially be affected by the construction and operation of projects in the 2008 RTP. **Table 3.11-13** shows the current residential and business land uses that are located within the 150 feet of either side of the RTP projects.

As indicated in **Table 3.11-13**, all types of residential and business uses would be impacted by RTP projects. In total, the 2008 RTP includes approximately 71,866 new lane miles including freeways, toll roads, major and minor arterials and HOV lanes. These additional transportation facilities could displace homes and businesses in the region.

TABLE 3.11-13
RESIDENTIAL AND BUSINESS LAND USES WITHIN 150-FOOT RADIUS OF 2008 RTP FREEWAY, TRANSIT, AND FREIGHT RAIL PROJECTS

Land Use	Acres
Low Density Residential	495
Medium to High Residential	5,652
Rural Density Residential	267
Extraction	192
Commercial	4,598
Industrial	3,006

SOURCE: SCAG GIS Analysis, 2007
SCAG Land Use, 2005.

Additional residential and business lands would be affected by the growth associated with the 2008 RTP. The effect of growth and urban development on agricultural lands is addressed in the Cumulative Impacts section of this chapter.

Displacement of existing homes and businesses would be **significant**.

Mitigation Measures

MM-POP.2: For projects with the potential to displace homes and/or businesses, project implementation agencies shall 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 shall be minimized to the extent feasible. If possible, existing rights-of-way should be used.

MM-POP.3: Project implementation agencies shall develop a construction schedule that minimizes potential neighborhood deterioration from protracted waiting periods between right-of-way acquisition and construction.

Significance after Mitigation

Not all of the projects in the 2008 RTP will be able to be built in existing rights-of-way. A substantial number of businesses and residences would be displaced through the development of projects in the 2008 RTP. This impact would remain **significant**.

Cumulative Impact 3.2-3: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to currently vacant natural land.

Implementation of the 2008 RTP in combination with increases in population, households, and employment and other land consumption would be expected to consume about 200,000 acres (compared to about 655,000 acres under the No Project Alternative) of vacant, open space/recreation and agricultural land.[1] Vacant, open space/recreation and agricultural land would be consumed in all six counties. The accessibility gained by improving mobility to vacant areas of the region through implementation of the 2008 RTP would contribute to this cumulatively considerable impact.

Mitigation Measures

Mitigation measures MM-POP.1 through MM-POP.4 would be applied to mitigate this cumulative impact in addition to the following measure.

MM-POP.4: 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.

Significance after Mitigation

The accessibility afforded by the 2008 RTP, and the expected shifts in population, households, and employment associated with the mobility benefits would change the growth patterns in the region. The impact would remain **significant**.

Comparison With The No Project

Given the location of the region, its mild climate and existing population trends, growth in the region is inevitable. In the No Project alternative, the population of the SCAG region grows by the same number of people (approximately 5.14 million); however no regional transportation investments are made above the existing programmed projects.

Direct Impacts

The No Project contains fewer transportation investments than the Plan Alternative. 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

[1] Fregonese Associates. (2007). Unpublished data provided to SCAG. Los Angeles, CA.

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 Alternative 7,800 acres of business land uses and 6,500 acres of residential land uses would be affected by transportation projects.

The Plan impacts would be greater than the No Project impacts for Impact 3.2-1, 3.2-2, and 3.2-3.

Cumulative Impacts

The No Project Alternative is expected to accommodate the same increase in total population as the proposed Plan. However, the 2008 Plan includes land use measures that would help reduce the displacement, disruption or diversion of existing communities. These mitigation measures are absent in the No Project Alternative. The proposed 2008 Plan 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 2008 Plan could help facilitate population and economic growth in areas of the region that are currently not developed. While the 2008 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 655,000 acres of vacant, open space/recreation and agricultural lands, while the 2008 Plan would consume about 200,000 acres. Although the 2008 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, employment and households.

Therefore, *the No Project Alternative's cumulative impacts to population, households, and employment would be approximately the same as those of the 2008 RTP.*

References - Population, Housing, and Employment

California Association of Realtors. *2007 Annual Historical Data*; Retrieved online December 10, 2007. http://www.car.org/index.php?id=Mw==

Construction Industry Research Board, (n.d.) *Residential Building Permits in the SCAG Region* 2000-2006. http://www.cirbdata.com/datas1.html

State of California, Department of Finance. 1900-2000 U.S. Decennial Census, *E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2007, with 2000 Benchmark. Sacramento, California, May 2007*.

State of California, Department of Finance, *Race/Ethnic Population with Age and Sex Detail, 2000–2050.* Sacramento, CA, July 2007.

State of California, Employment Development Department, Labor Market Information Division, *Monthly Labor Force Data for Counties, Annual Average, 2006 Benchmark, March 2, 2007*.

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3.12 Public Services and Utilities

This section evaluates the public services and utilities in the SCAG region that may be affected by the 2008 RTP. The potential impacts on the public resources including police protection services, fire protection services, school facilities, and solid waste removal are identified. The chapter also identifies mitigation measures for the impacts and evaluates the residual effects.

Environmental Setting

The environmental setting describes the public services and utilities that could be affected by the 2008 RTP. The environmental setting addresses police protection services, fire protection services, education facilities, and solid waste disposal in the region.

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 3.12-1** 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.

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. There are fire protection agencies that also 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

TABLE 3.12-1
POLICE SERVICE PROVIDERS FOR JURISDICTIONS WITHIN SCAG COUNTIES [3]

County	Jurisdictions Served By	
	County Sheriff's Department [1]	City Police Department [2]
Imperial	*1*	*7*
Los Angeles	*41*	48
Orange	*13*	*22*
Riverside	*12*	*13*
San Bernardino	*15*	10
Ventura	6	5

SOURCES:

Imperial County Sheriff's Department – Personal Contact, August 28, 2007
Los Angeles County Sheriff's Department, Retrieved August 27, 2007 from
http://www.lasd.org/lasd_services/contract_law/contract_cities.html

Orange County Sheriff's Department, Retrieved August 27, 2007 from
http://www.ocSheriff's Deparment.org/

Riverside County Sheriff's Department, Retrieved August 27, 2007 from
http://www.riversidesheriff.org/department/city-com.htm

San Bernardino Sheriff's Department, Retrieved August 27, 2007 from
http://www.co.san-bernardino.ca.us/sheriff/patrol/Patrol.asp

Ventura County Sheriff's Department, Retrieved August 27, 2007 from
http://www.vcSheriff's Deparment.org/patrol_services/index.html

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.

preventative measures to provide fire suppression and emergency response services for all private, institutional, and public facilities within their area of responsibility. **Table 3.12-2** 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.

Educational Facilities

There are approximately 3.2 million students enrolled in schools in the SCAG region, ranging from kindergarten to twelfth grade region, with approximately 150,000 teachers. **Table 3.12-3** lists the public school student and teacher totals by county. **Table 3.12-4** shows the number of school districts along with both public and private schools in the SCAG region by county.

Solid Waste Disposal and Transfer Facilities

Over the past ten 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 3.12-5** shows data from the California Integrated Waste Management Board (CIWMB) regarding the number of tons disposed in 2005 (the most recent year for which information is available), for each county in the SCAG region.

TABLE 3.12-2
FIRE PROTECTION SERVICE PROVIDERS FOR JURISDICTIONS WITHIN SCAG COUNTIES [1]

County	Jurisdictions Served By		
	County Fire Department [2]	City Fire Departments	Fire Protection Districts or Other Independent Fire Agencies
Imperial	2	6	4
Los Angeles	59	30	1 [5]
Orange	23	10	1 [5]
Riverside	18	8	5
San Bernardino [3]	7	13	15 [4]
Ventura	7	4	- -

SOURCES:

Imperial County Fire Department – County Fire Chief Fred Nippins – October 15, 2007
http://www.imperialcounty.net/EmergencyPlans/MultiHazardMitigationPlan.pdf September 18, 2007
Los Angeles County Fire Department, Retrieved August 28, 2007 from http://www.fire.lacounty.gov/SpecialOps/SpecOps911Dispatch.asp
Orange County Fire Authority, Retrieved August 27, 2007 from http://www.ocfa.org/ocfamain.asp?pgn1=4
Riverside County Fire Department, Retrieved August 27, 2007 from http://www.rvcfire.org/opencms/ContractCities/
San Bernardino Fire Department, Retrieved August 27, 2007 from http://sbcfire.org/
Ventura County Fire Department, Retrieved August 27, 2007 from
http://www.vcFire Deparment.org/patrol_services/index.html
California Fire Departments website, Retrieved August 27, 2007 from http://www.firedepartments.net/California/CA.html

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 visa 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.

TABLE 3.12-3
KINDERGARTEN THROUGH GRADE 12 ENROLLMENT AND TEACHERS IN THE SCAG REGION FOR THE 2006-2007 SCHOOL YEAR

County	Enrollment K-12	Teachers
Imperial	36,293	1,765
Los Angeles	1,673,246	79,702
Orange	503,955	22,923
Riverside	413,059	18,938
San Bernardino	427,583	19,349
Ventura	142,488	6,720
SCAG Region	3,196,624	149,397
California	6,286,952	308,790

SOURCE: California Department of Education, Educational Demographics Unit. (2007, May 14). Enrollment in California public schools by county 2006-2007 [Data Query] and Number of teachers in California public schools by ethnicity by county 2006-07 [Data Query]. Retrieved June 19, 2007 from the California Department of Education Web site, http://dq.cde.ca.gov/dataquest/.

TABLE 3.12-4
PUBLIC AND PRIVATE SCHOOLS IN THE SCAG REGION

County	Public Schools						Private Schools	
	K-12		Community College		UC System	Cal State System	K-12	College [1]
	Districts	Schools	Districts	Schools				
Imperial	16	77	1	1	- -	- -	9	- -
Los Angeles	80	2,215	13	22	1	5	1,040	41
Orange	28	709	4	9	1	1	296	9
Riverside	23	530	4	4	1	- -	149	2
San Bernardino	33	614	5	6	- -	1	176	2
Ventura	20	241	1	3	- -	1	85	3
Total	200	4,386	28	45	3	8	1,755	57

NOTES:
Imperial County Office of Education. Retrieved August 29, 2007 from http://www.icoe.k12.ca.us/ICOE/
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1. Western Association of Schools and Colleges, Retrieved August 30, 2007 from http://www.wascsenior.org/wasc/

TABLE 3.12-5
SOLID WASTE DISPOSED OF IN THE SCAG REGION – CY 2005

County	Total Tonnage
Imperial	271,978
Los Angeles	9,852,405
Orange	5,202,149
Riverside	3,741,036
San Bernardino	1,919,998
Ventura	1,281,287
SCAG Region	22,268,862
California	42,158,298

SOURCE: California Integrated Waste Management Board Landfill Tonnage Reports. Retrieved August 28, 2007 from: http://www.ciwmb.ca.gov/Landfills/Tonnages/

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 3.12-1** illustrates the location of landfills in the region and **Table 3.12-6** provides detailed information on permitted active or planned solid waste landfills in the SCAG region.

TABLE 3.12-6
PERMITTED ACTIVE SOLID WASTE LANDFILLS IN THE SCAG REGION

Name	County	Closure date	Daily Disposal (tons/day)	Maximum Capacity (cu yds)	Remaining Capacity (cu yds)
Allied Imperial Landfill	Imperial	1/1/2013	1,135	4,324,200	2,105,500
Calexico Solid Waste Site	Imperial	1/1/2022	150	2,064,598	1,530,950
Holtville Solid Waste Site	Imperial	4/1/2007	20	654,800	17,006
Hot Spa Solid Waste Site	Imperial	4/1/1936	10	516,266	57,497
Imperial Solid Waste Site	Imperial	9/1/2015	207	1,936,000	183,871
Monofill Facility	Imperial	3/1/2012	750	1,729,800	1,314,800
Niland Solid Waste Site	Imperial	4/1/2020	55	131,000	44,053
Picacho Cut And Fill Site	Imperial	1/1/2000	15	645,333	77,021
Salton City Solid Waste Site	Imperial	9/1/2011	50	2,581,000	9,078
Antelope Valley Public Landfill I	Los Angeles	7/1/1999	1,400	6,480,000	2,978,143
Antelope Valley Public Landfill II	Los Angeles	1/1/2008	1,800	8,206,000	8,206,000
Burbank Landfill Site No. 3	Los Angeles	1/1/2053	240	5,933,365	5,107,465
Calabasas Sanitary Landfill	Los Angeles	1/1/2028	3,500	69,700,000	16,900,400
Chiquita Canyon Sanitary Landfill	Los Angeles	11/24/2019	6,000	63,900,000	35,800,000
Lancaster Landfill and Recycling Center	Los Angeles	8/2/2012	1,700	26,665,000	19,088,739
Pebbly Beach (Avalon) Disposal Site	Los Angeles	1/1/2033	49	143,142	104,100
Puente Hills Landfill	Los Angeles	10/31/2013	13,200	106,400,000	49,348,500
San Clemente Island Landfill	Los Angeles	1/1/2032	10	235,459	209,816
Savage Canyon Landfill	Los Angeles	1/1/2025	350	8,119,412	7,419,580
Scholl Canyon Sanitary Landfill	Los Angeles	1/1/2019	3,400	69,200,000	10,804,900
Sunshine Canyon City Landfill Unit 2	Los Angeles	Unknown	5,500	13,441,300	13,441,300
Sunshine Canyon SLF County Extension	Los Angeles	1/31/2013	6,600	37,315,352	17,015,625
Frank R. Bowerman Sanitary LF	Orange County	12/31/2022	8,500	127,000,000	59,411,872
Olinda Alpha Sanitary Landfill	Orange County	12/31/2013	8,000	74,900,000	38,587,383
Prima Deshecha Sanitary Landfill	Orange County	12/31/2067	4,000	172,900,000	87,384,799
Badlands Sanitary Landfill	Riverside County	1/1/2016	4,000	30,386,332	21,866,092
Blythe Sanitary Landfill	Riverside County	5/31/2034	400	4,633,000	2,289,139
Desert Center Landfill	Riverside County	1/1/2011	60	117,032	23,246
El Sobrante Landfill	Riverside County	1/1/2030	10,000	184,930,000	158,857,914
Lamb Canyon Sanitary Landfill	Riverside County	1/1/2023	3,000	34,292,000	20,908,171
Mecca Landfill II	Riverside County	1/1/2007	400	372,480	34,786
Oasis Sanitary Landfill	Riverside County	Unknown	400	870,000	75,727
Barstow Sanitary Landfill	San Bernardino County	5/1/2012	750	3,584,500	924,401
California Street Landfill	San Bernardino County	1/1/2031	829	10,000,000	6,800,000

TABLE 3.12-6 (continued)
PERMITTED ACTIVE SOLID WASTE LANDFILLS IN THE SCAG REGION

Name	County	Closure date	Daily Disposal (tons/day)	Maximum Capacity (cu yds)	Remaining Capacity (cu yds)
Colton Sanitary Landfill	San Bernardino County	1/1/2006	31,000	13,297,000	610,000
Fort Irwin Sanitary Landfill	San Bernardino County	1/1/2045	100	19,000,000	18,935,202
Landers Sanitary Landfill	San Bernardino County	1/1/2013	1,200	3,080,000	1,300,000
Mid-Valley Sanitary Landfill (1)	San Bernardino County	4/1/2033	7,500	62,000,000	71,500,000
Mitsubishi Cement Plant Cushenbury L.F.	San Bernardino County	1/1/2034	40	520,400	227,000
San Timoteo Sanitary Landfill	San Bernardino County	5/1/2016	1,000	20,400,000	9,491,163
USMC - 29 Palms Disposal Facility	San Bernardino County	1/1/2076	100	10,945,000	10,821,000
Victorville Sanitary Landfill	San Bernardino County	10/1/2047	3,000	83,200,000	82,200,000
Simi Valley Landfill & Recycling Center	Ventura County	12/1/2033	3,000	43,500,000	23,201,173
Toland Road Landfill	Ventura County	5/3/2027	1,500	30,000,000	19,199,130
			Total	1,360,249,771	826,412,542

SOURCE: California Integrated Waste Management Board. Solid waste information system. Retrieved August 29, 2007 from http://www.ciwmb.ca.gov/swis/Search.asp.

1) Values for Maximum Capacity and Remaining Capacity are what are shown on web site. They may have been transposed.

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.

Table 3.12-7 shows the progress of local jurisdictions meeting AB 939 diversion requirements. The table shows the number of jurisdictions with diversion rates over 50 percent, the number with diversion rates between 25 percent and 50 percent, and the number with diversion rates below 25 percent. These diversion rate estimates, from the CIWMB, are based on the State-approved formula which utilizes the number of tons reported disposed and information regarding increases in population, employment and/or taxable retail sales.

TABLE 3.12-7
DIVERSION RATE SUMMARY

County	Diversion Rate Range (Percentage)	Year/Number of Jurisdictions Reporting			
		2002	2003	2004	2005
Imperial	0-24	3	1	2 (1)	2
	25-49	3	4	4	4
	50-	1	1	2	2
	Not Reporting	1	2	0	0
	Preliminary (2)	0	0	0	8
Los Angeles	0-24	2	3	0	5
	25-49	37	26	18	39
	50-	43	38	49	30
	Not Reporting	7	9	9	0
	Preliminary (2)	3	9	8	*74* (3)
Orange	0-24	1	2	1	0
	25-49	11	15	14	*19*
	50-	19	16	20	*16*
	Not Reporting	1	0	0	0
	Preliminary (2)	0	2	2	*35*
Riverside	0-24	0	1	2	*2*
	25-49	7	8	7	15
	50-	16	16	16	8
	Net Reporting	2	0	0	0
	Preliminary *(2)*	0	2	2	25
San Bernardino	0-24	0	0	2	1
	25-49	18	18	13	13
	50-	6	6	10	11
	Not Reporting	1	1	1	0
	Preliminary (2)	0	6	8	25
Ventura	0-24	0	0	0	0
	25-49	3	4	4	7
	50-	7	7	7	4
	Not Reporting	1	0	0	0
	Preliminary (2)	0	5	5	11

SOURCE: California Integrated Waste Management Board, Countywide, Regionwide, and Statewide Jurisdiction Diversion Progress Report. Retrieved on August 30, 2007 from http://www.ciwmb.ca.gov/LGTools/mars/jurdrsta.asp

Notes:

1) Holtville had a Division Rate of -2 Percent and Westmorland had a Division Rate of -12 Percent.
2) Preliminary data is subject to change during the Board review process or when a jurisdiction submits updated information.
3) The following cities are part of the Los Angeles Area Integrated Waste Management Authority Regional Agency: Artesia, Beverly Hills, Duarte, Gardena, Hidden Hills, Los Angeles, Lynwood, Manhattan Beach, Pomona, Rancho Palos Verdes, Redondo Beach, Rosemead, Sierra Madre, South Gate, and Torrance and are included in that agency's diversion rate.

Urban Transportation Features

Elements of the transportation infrastructure, including roadways, freeways, bridges, and railroads, among others, are a large component of the urban environment and affect public services and utilities. A discussion of urban transportation features is included below.

Freeways, Highways, and Roadways

On public roadways, there is a constant need for emergency services including police, fire, and paramedic services. Safety and a constant flow of traffic are maintained by the aforementioned public services on all freeways, highways, and roadways in the SCAG region and help facilitate efficient emergency response. In addition, the major ports, airports and shipping centers described below all require police, fire and emergency services to operate efficiently.

Rail

Rail operations in the SCAG region can be broken down into two categories, passenger or freight. Passenger operations include Amtrak, Metrolink and Los Angeles County Metropolitan Agency (Metro) operated light and heavy rail lines.

Freight service generally includes those operated by BNSF, formally known as Burlington Northern Santa Fe Railway and Union Pacific Railroad (UP). Railyard facilities within the region are predominately located within industrial areas including the Port of Los Angeles, the Port of Long Beach, East Los Angeles, Hobart, City of Industry (Los Angeles County), and West Colton. 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. Airports with both passenger and cargo capability in the region include: Imperial County Airport (IPL) in Imperial County; Los Angeles International Airport (LAX), Bob Hope Airport (BUR), Long Beach Airport (LGB), and Palmdale Regional Airport (PMD) in Los Angeles County; John Wayne Airport (SNA) in Orange County; Ontario International Airport (ONT) in San Bernardino County; Palm Springs International Airport (PSP) in Riverside County; and Oxnard Airport (OXR) in Ventura County. San Bernardino International Airport (SBD) and Southern California Logistics Airport (VCV) in San Bernardino County and March Inland Port (RIV) in Riverside County operate as cargo only airports.

Ports

The SCAG region includes three primary ports: the Ports of Los Angeles, Long Beach and Hueneme. Theses ports are multi-faceted facilities, handling container ships, non-containerized bulk cargo ships, and tanker ships. Combined these ports handle approximately 40 percent of the volume imported into the country and approximately 24 percent of the nation's exports, and one out of every seven jobs in Southern California depends on this trade. As the only deep water port

between Los Angeles and San Francisco, the Port of Hueneme in Ventura County is a major shipping point for automobiles, fresh fruit and produce. Approximately $7 billion in cargo traverses through the Port of Hueneme annually.

Regulatory Setting

The regulatory setting describes the federal, state, and local agencies that have jurisdiction over public services and utilities. The regulations pertinent to public services and utilities that each of these agencies enforce are also described.

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 U.S. Environmental Protection Agency has delegated the enforcement responsibility to the State of California. California laws and regulations governing these facilities are summarized below.

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.[1]

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

[1] California Integrated Waste Management Board, "California Waste Stream Profiles: Jurisdictions," Retrieved December 14, 2007 from http://www.ciwmb.ca.gov/profiles/juris/.

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 Integrated Waste Management Act. 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).[2]

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.[3]

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

2 California Integrated Waste Management Board, Countywide Integrated Waste Management Plan Enforcement, Retrieved November 8, 2007 from http://www.ciwmb.ca.gov/LgLibrary/Policy/CIWMPEnforce/Default.htm#Table

3 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.

selection, funding, implementation schedule and education and public information.[4]

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.[5]

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).

Local Agencies and Regulations

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 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

4 Title 14, Chapter 9, of the CCR: Article 6.3 and 7.0) Statutes: PRC Sections 41500-41510.

5 P R C, Sections 41730-41736.

completed by 2008.

The County's 2004 Annual Report details the revision process, assesses remaining permitted capacity for the mandated 15-year planning horizon, and outlines five 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 shortage of processing capacity in the county, insufficient markets for recovered materials, necessary updates to the Disposal Reporting System to incorporate all recommendations made by the legislature, 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 2005 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 2004 Annual Report found the original plan remained applicable, so no comprehensive update is planned. The Non-disposal Facility element was updated in 2006 to include amendments to one transfer and processing facility and one recycling facility. It also includes plans for two proposed composting facilities and one transfer station/materials recovery facility, pending permit approval. The 2004 Annual Report observed that by utilizing current programs and facilities, Riverside County has 19 years of disposal capacity remaining.

San Bernardino County

San Bernardino County revised its CIWMP in 2002; its five-year review is scheduled in 2007. The 2002 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. Facilities changes include expansion of the California Street Landfill by the City of Redlands, and the planned expansions of both the Barstow and Victorville landfills. The feasibility of Landers and San Timoteo landfill expansions is being assessed. The 2002 review found sufficient disposal

capacity for the next 15 years, and if the planned landfill expansions are completed, the county will have nearly 50 years of disposal 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 2005, which addressed future needs, plans, and policies. The County had approximately 22 years of disposal capacity remaining when the report was issued.

Cities

Cities are responsible for working with each county's Local Task Force to create SRREs and HHWEs for inclusion in the county plan. The SRRE details how the jurisdiction will comply with the diversion rates mandated by the State, and the HHWE details how the jurisdiction will handle household hazardous waste. These elements are reviewed every five years and updated when necessary.

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

The South Coast Air Quality Management District (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.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the proposed Plan on existing public services and associated environmental effects.

Comparison with the No Project

The analysis of public services 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 2008 RTP.

Determination of Significance

The public services analysis evaluates utilities and public services that are most likely to be affected by the implementation of the projects, programs, and policies identified in the Plan. Impacts to public services 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 below to the expected future (2035) demand for public services and compares future demand with the Plan to the existing capacity for public services.

Significance Criteria

A significant impact is defined as "a substantial or potentially substantial, adverse change in the environment" (CEQA § 21068). The proposed Plan would have a significant impact if implementation would:

- Create a substantial need within the region for construction of additional public facilities, such as fire and police stations, schools or other public facilities; or
- Uncover and potentially sever underground utility lines; or
- 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.

Impacts and Mitigation Measures

Implementation of the 2008 RTP will affect public school services and utilities. Expected significant cumulative impacts include demand for more police, fire, and emergency personnel and facilities.

Both short-term construction related impacts and long-term or permanent impacts from new facilities potentially would result from implementation of the proposed Plan. Below are descriptions of the types of direct impacts foreseeable from new transportation projects proposed in the 2008 RTP. Indirect, cumulative impacts from implementation of the proposed 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.

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.

Impact 3.12-1: Construction and implementation of the 2008 RTP would affect the level of transportation-related public services facilities, such as police and fire/emergency personnel and associated stations or other public facilities in the SCAG region.

Police services, fire protection, and emergency medical services within the SCAG region are provided by numerous agencies within multiple jurisdictions (see **Tables 3.12-1** and **3.12-2**). 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 could be potentially significant. As part of project specific environmental review, the project implementation agency 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 police, fire, and medical services at the construction sites of 2008 RTP projects for security and safety purposes. However, construction sites are typically secured and have security onsite. The impact of the construction sites themselves on police, fire and emergency medical services is anticipated to be short-term in nature and less than significant. There are several types of projects included within the 2008 RTP that, upon completion, would require different levels of police, fire, and medical services. Projects involving new roadways are anticipated to require police, fire, and emergency medical services for safety purposes.

Transit-related projects would, in many cases, involve the construction of transit stations. These transit stations, upon completion, would require police, fire, and emergency medical services. In some cases, such as with Metro, the governing transit authority provides security. Additionally, the increased use of transit would involve an increased need for police, fire, and emergency medical services for protection and rescue services.

Rail projects, other than transit stations, are anticipated to require minimal amounts of additional fire, police, and emergency medical services for safety purposes.

The improvement of and the increased usage of non-motorized transportation methods, such as bicycle routes, are anticipated to require minimal amounts of additional police, fire, and emergency medical services. If restrooms or drinking fountains are incorporated into non-motorized transportation projects, these uses would require a minimal amount of police, fire, and emergency medical personnel for security and safety.

Throughout the SCAG region, public service and utility providers have historically accommodated increases in demand. For the most part, the 2008 RTP transportation projects would not generate a substantial, direct need for additional police, fire, and emergency medical services. Only new facilities, such as transit stations, could require potentially significant levels of police, fire, and medical services. Fire and medical services are anticipated to be sufficient in their local jurisdictions to handle the increase in demand generated by facilities like transit stations. 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.

Based on the demand for public service and utility for similar projects and on the current capacities of existing fire, police, and medical services, the total projected demand for each of these types of projects is not anticipated to be significant.

School facilities would not be directly affected by implementation of the 2008 RTP. The cumulative effect of the resulting population growth and distribution would affect schools. This will be discussed in the cumulative impact section of this chapter.

Before mitigation the direct demand for public services and utilities would be potentially significant.

Mitigation Measures

MM-PS.1: Project implementation agencies shall ensure that prior to construction all necessary local and state road and railroad encroachment permits are obtained. The project implementation agency shall 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 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 shall 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.

Significance after Mitigation

The impact would be **less than significant** with mitigation.

Impact 3.12-2: Construction necessary to implement the 2008 RTP 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 potentially break those lines. To accommodate the projected growth, numerous new developments would be built and existing development would be recycled into new uses. These building activities would uncover and potentially sever different types of underground utility lines. However, the project implementation agency is normally required to incorporate the locations of existing utility lines into the construction schedule prior to construction. Prior knowledge and avoidance during construction of existing utility lines would reduce this impact to less than significant.

Mitigation Measures

MM-PS.2: Prior to construction, the project implementation agency shall identify the locations of existing utility lines. The contractor shall avoid all known utility lines during construction.

Significance after Mitigation

The impact would be **less than significant** after mitigation.

Impact 3.12-3: Construction necessary to implement the 2008 RTP would affect the

demand for solid waste services in the SCAG region.

Several of the projects within the 2008 RTP have the potential to generate a significant amount of solid waste during construction, such as new transit lines, truck lanes, and HSRT projects through grading and excavation activities. Construction debris would be recycled 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. Therefore, the projects proposed under the 2008 RTP are not anticipated to generate a significant amount of solid waste during construction. Nevertheless, the amount of debris generated during project construction would need to be evaluated prior to construction on a project by project basis. The mitigation measures described below would help to reduce impacts.

Several projects within the 2008 RTP would involve the construction of roadways, rails, and facilities at various locations throughout the SCAG region. It is assumed that these projects, upon completion, will require additional public services and utilities to handle increased demand for solid waste services. These increases would need to be evaluated on a project by project basis.

In some cases, transit-related projects would involve the construction of transit stations. These transit stations would generate incremental amounts of solid waste. The increased use of transit methods of transportation, such as buses and trains, would involve a minimal increase in the demand for solid waste collection.

Rail projects, other than transit-related rail, are not anticipated to require additional solid waste service unless they involve the construction of additional railways or facilities.

The improvement of and increased usage of non-motorized transportation methods, like bike routes, are not anticipated to require additional levels of solid waste. If restrooms are incorporated into non-motorized transportation projects, these uses would also require minimal amounts of solid waste (for trash receptacles) services.

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 3.12-6**, 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, resulting in a significant impact.

Mitigation Measures

MM-PS.3: Projects identified in the 2008 RTP that require solid waste collection 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 shall be identified in each project's CEQA documentation.

MM-PS.4: Each of the proposed projects identified in the 2008 RTP shall comply with applicable regulations related to solid waste disposal.

MM-PS.5: The construction contractor shall work with the respective County's Recycling Coordinator to ensure that source reduction techniques and recycling measures are incorporated into project construction.

MM-PS.6: The amount of solid waste generated during construction will be estimated prior to construction, and appropriate disposal sites will be identified and utilized.

MM-PS.7: Project implementation agencies shall 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 would 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-PS.8: Project implementation agencies shall 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 should be sited with an adequate landfill-owned, undeveloped land buffer to minimize the potential adverse impacts of the landfill in neighboring communities.

MM-PS.9: Project implementation agencies shall discourage exporting of locally generated waste outside of the SCAG region. Disposal within the county where the waste originates shall 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 SCAQMP and RTP policies

should be required.

MM-PS.10: Project implementation agencies shall adopt Zero Waste goals and practices and look for opportunities for voluntary actions to exceed the 50% waste diversion target.

MM-PS.11: Project implementation agencies shall build local markets for waste prevention, reduction, and recycling practices.

MM-PS.12: Project implementation agencies shall develop ordinances that promote waste prevention and recycling such as: requiring waste prevention and recycling efforts at all large events and venues; implementing recycled content procurement programs; and instituting ordinances to divert food waste away from landfills and toward food banks and composting facilities.

MM-PS.13: Project implementation agencies shall develop environmentally friendly alternative waste management strategies such as composting, recycling, and conversion technologies.

MM-PS.14: Project implementation agencies shall develop and site composting, recycling, and conversion technology facilities that are environmentally friendly and have minimum environmental and health impacts.

Significance after Mitigation

The impact would be **less than significant** after mitigation.

Cumulative Impact 3.12-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to the response times of police and fire and emergency services in the SCAG region.

By 2035, the SCAG region is anticipated to add an additional 5.14 million people and approximately 200,000 urbanized acres with the 2008 RTP. Under the 2008 RTP, freeway speeds are expected to decline by approximately two miles per hour. This change in freeway speeds would not be expected to have a significant impact on response times for emergency vehicles.

Mitigation Measures

Less than significant. None required.

Significance after Mitigation

The impact would not be cumulatively considerable and would be **less than significant**.

Cumulative Impact 3.12-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to the staffing level of police and fire and emergency services in the SCAG region.

The forecast 5.14 million new people in the region will require police, fire, and other emergency personnel, beyond current staffing levels. Cities and counties in the region set minimum response times for police and fire protection. Police and fire and emergency service needs will be determined on a project-level basis by individual police and fire service providers. The 2008 RTP projects that 200,000 acres of land uses including vacant land, open space and recreational lands, farmland, and water & floodways will be affected by Major Highway, Transit, and Freight Rail projects. This acreage equals approximately 300 square miles of area that will need to be serviced by police, fire, and other emergency personnel.

Mitigation Measures

MM-PS.15: The growth inducing potential of individual 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 then will make any necessary adjustments to the applicable General Plan. Any such identified adjustment shall be communicated to SCAG.

MM-PS.16: The project implementation agency shall identify projects in the 2008 RTP that require police protection, fire service, and emergency medical service and shall 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 shall be identified in each project's CEQA documentation.

Significance after Mitigation

The demand to hire and train new police, fire and emergency personnel would remain a significant impact.

Cumulative Impact 3.12-6: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation

measures, influences the pattern of this urbanization. The 2008 RTP's influence on urbanization patterns contributes to regional cumulatively considerable impacts to the number of school-age children and the demand for school facilities in different parts of the SCAG region.

Population in the SCAG region is anticipated to increase by approximately 5.14 million people, regardless of the 2008 RTP. The population of school-aged children (5-17) is anticipated to increase by approximately 600,000. This growth will require that additional schools and classrooms be built to accommodate the new students. Additional teachers will also be required to accommodate the increase in students.

Mitigation Measures

MM-PS.17: Project implementation agencies shall undertake project specific review of the public utilities and services as part of project specific environmental review. For any identified impacts, project implementation agencies shall ensure that the appropriate school district has the school capacity, or is planning for the capacity, that the project will generate. Appropriate mitigation measures, such as new school construction or expansion, shall be identified. The project implementation agencies or local jurisdiction shall be responsible for ensuring adherence to the mitigation measures. SCAG shall be provided with documentation of compliance with any necessary mitigation measures.

Significance after Mitigation

The region's cumulative demand for new schools and teachers would be a significant impact on public services.

Cumulative Impact 3.12-7: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence would create a cumulatively considerable impact to the demand for solid waste services in the SCAG region.

The population of the SCAG region is forecast to increase by approximately 5.14 million people by 2035. The Los Angeles County Department of Public Works estimates that the average resident in Los Angeles County disposes of 2.4 pounds of trash per day, considering an average diversion rate of 50 percent. Assuming a similar generation rate, residents in Los Angeles County would generate approximately 30 million pounds of waste per day in 2035.[6] The remaining counties in the SCAG region would generate approximately 24 million pounds of waste per day in 2035 for a regional total of approximately 54 million pounds per day, with half (27 pounds)

6 Personal communication, Richard Ledesma, Los Angeles County Department of Public Works, November 20, 2007. Includes both residential and non-residential generation.

requiring landfilling.[7,8] Non-residential land uses also generate waste, and generally at a higher rate than residential uses. Based on data from CIWMB, non-residential uses in the SCAG region would generate approximately 53 million pounds of waste per day in 2035, with approximately 26 million pounds per day requiring landfilling.[9]

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 3.12-6**. There is sufficient capacity for waste disposal in the region through 2035. However, there may be insufficient waste disposal capacity where the waste is being generated. Solid waste may need to be transported by truck or rail from urbanized areas to the remote disposal locations in Riverside and Imperial Counties.

Cumulative impacts of transporting 107 million pounds of waste per day to appropriate disposal areas would be significant.

Mitigation Measures

MM-PS.18: The California Integrated Waste Management Board shall continue to enforce solid waste diversion mandates that are enacted by the Legislature.

MM-PS.19: Local jurisdictions shall continue to adopt programs to comply with state solid waste diversion rate mandates and, where possible, shall encourage further recycling to exceed these rates.

MM-PS.20: Local jurisdictions shall 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-PS.21: Project implementation agencies shall coordinate regional approaches and strategic siting of waste management facilities.

MM-PS.22: Project implementation agencies shall 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 by making priority funding available for projects that involve co-location of facilities.

MM-PS.23: Project implementation agencies shall prioritize siting of new solid waste management facilities including recycling, composting, and conversion technology facilities in conjunction with existing waste management or material recovery

7 California Integrated Waste Management Board, California Waste Stream Profiles by County, Residential Disposal (Pounds per Resident per Day). Retrieved November 30, 2007 from http://ciwmb.ca.gov/Profiles/County.

8 Assuming all jurisdictions meet the AB 939 diversion rate of 50 percent.

9 California Integrated Waste Management Board, California Waste Stream Profiles by County, Non-Residential Disposal (Pounds per Employee per Day), Retrieved December 3, 2007 from http://www.ciwmb.ca.gov/Profiles/.

facilities.

MM-PS.24: Project implementation agencies shall 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-PS.25: SCAG shall encourage projects to reuse and recycle construction and demolition waste.

MM-PS.26: SCAG shall encourage methane recovery in local landfills and wastewater treatment plants to generate electricity.

Significance after Mitigation

While disposal capacity for the solid waste in 2035 has been identified, the cumulative impacts of collecting solid waste, transporting it to an available facility, and disposing of it would remain **significant**.

Comparison with the no Project

In the No Project alternative, the population of the SCAG region grows by 5.14 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

Under the No Project Alternative, the need for public services and facilities for transportation projects would be less than under the Plan Alternative because fewer projects would be built. The potential that building the projects would disrupt or sever underground utility lines also would be less in the No Project Alternative than in the Plan Alternative because there are fewer transportation projects.

The Plan impacts would be greater than the No Project impacts for Impacts 3.12-1, 3.12-2, and 3.12-3.

Cumulative Impacts

Cumulatively, 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 Alternative.

The cumulative need for additional emergency personnel, schools, and solid waste services to

accommodate the population would be the same in the No Project Alternative as in the Plan Alternative. Under the No Project Alternative new growth would be spread over about 655,000 acres of vacant, open space/recreational and agricultural lands compared to about 200,000 under the Plan. Thus greater extension of infrastructure would be needed under the no Project Alternative.

The Plan Alternatives cumulative impacts would be less than the No Project Alternative's cumulative impacts for Cumulative Impact 3.12-4 and approximately the same for Cumulative Impacts 3.12-5 through 3.12-7.

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3.13 Security and Emergency Preparedness

This section evaluates the impacts of the 2008 RTP on the security of and emergency preparedness of the region. The chapter also identifies mitigation measures for the impacts and evaluates the residual effects.

Environmental Setting

Southern California is home to significant natural disasters; including earthquakes, wildfires, flooding and mudslides. 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 terrorist attacks. The September 11, 2001 terrorist 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. Currently, 18.4 million people reside in the region and over 5.14 million more people are expected to be added by 2035. Over six percent of the national population lives in the SCAG region, and for over half a century the region has been home to half the population of California. 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.[1]

Definitions

The complexity of the SCAG region, with a range of potential terrorism targets, presents significant challenges in coordinating and implementing effective homeland security programs.

[1] National Cooperative Highway Research Project 525 Vol. 3 Transportation Planning Process. Page 16.

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.[2]

Transportation Security Vulnerabilities

Roadways and Freeway

Freeway Lanes Miles (excluding carpool)	10,683 miles
HOV Lane Miles	752 miles
Regional Arterial (Major and Minor) Route Lane Miles	36,954 miles

Public Transit

Buses	5,565 vehicles
Metro Rail	73 miles and 65 Stations
Metrolink	512 miles and 55 Stations

Aviation/Ports

Total air carrier airports	10
Total general aviation airports	45
Total commuter airports	2
LAX ranks among world's airports	5th in passengers and
	7th in air cargo tonnage
Share of US export container traffic	24 percent
Share of US import container traffic	41 percent

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

2 National Cooperative Highway Research Program Report 525 Volume 9 "Guidelines for Transportation Emergency Training Exercises" McCormick Taylor Inc. 2006

Border Protection Agency within the Department of Homeland Security (DHS) are charged with the management and control of the official ports of entry. Security planning includes local emergency services, as well as the California Highway Patrol (CHP).

The California Department of Transportation (Caltrans) District 11 has initiated the development of a Border Master Plan, to establish a process to institutionalize dialogue among local, state and federal stakeholders in the United States and Mexico. A key objective is 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 is a consideration in the development of the Border Master Plan.

Seaports

The DHS has designated the seaports of Long Beach, Los Angeles, and Port Hueneme as at risk for potential terrorist actions.[3] 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.

[3] Fiscal Year 2006 Infrastructure Protection Program. U.S. Department of Homeland Security, September 25, 2006

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; 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, 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 AFB), March Inland Port (joint use with March Air Reserve Base), Southern California Logistics Airport (formerly George AFB) and Palmdale Airport (joint use with Air Force Plant 42). The regional system also 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 50 local bus (demand response and paratransit) operators
- 4 commuter express bus services[4]
- 2 subway lines and 3 light rail lines situated within LA County
- Metrolink Commuter Rail network that spans 5 of the 6 counties in the SCAG region and North San Diego 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).

Regulatory Setting

Numerous laws and regulations at all levels of government are associated with security and emergency preparedness. The most relevant federal, state, and laws and regulations pertaining to security and emergency preparedness are summarized in this section.

Federal Agencies and Regulations

Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users

The bill known as Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU), which was signed into law on August 10, 2005, emphasized the need for transportation safety and security. SAFETEA-LU authorizes the federal surface transportation programs for highways, highway safety, and transit for the 5-year period, 2005-2009. It specifies that MPOs will conduct a metropolitan planning process that provides for consideration of projects and strategies that will “increase the security of the transportation system for motorized and non-motorized users.” The Federal Highways Administration released a Final Rule related to its interpretation of SAFETEA-LU, noting that the metropolitan transportation planning process should be consistent with the Strategic Highway Safety Plan, and other transit safety and security planning and review processes, plans, and programs, as appropriate. Effective March 16, 2007,

4 Santa Clarita, Antelope Valley, LA DOT 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.

under federal law, MPOs, like SCAG, are now tasked with addressing elements of security in their transportation plans.

U.S. Department of Homeland Security

The U.S. Department of Homeland Security (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

On March 2003, the Federal Emergency Management Agency (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 Plan

The National Response Plan is the national plan to respond to national emergencies, such as terrorist attacks, natural disasters or emergency. This National Response Plan is administered by the DHS. The National Response Plan, last updated May 25, 2006, establishes a comprehensive all-hazards approach to enhance the ability of the United States to manage domestic incidents. It forms the basis of how the federal government coordinates with state, local, and tribal governments and the private sector during incidents.

United States Department of Defense

The Department of Defense (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.[5]

Transportation Security Administration

The Transportation Security Administration (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 Disaster Mitigation Act of 2000 (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.

State Agencies and Regulations

California Department of Transportation

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

5 San Diego Association of Governments, 2007 Regional Transportation Plan White Paper: Public Safety and Homeland Security, July 21, 2006.

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.

Governor's Office of Emergency Services

The Office of Emergency Services (OES) was established as part of the Governor's Office in 1950 as the State Office of Civil Defense. The Governor's Office of Emergency Services coordinates overall state agency response to major disasters in support of local government. The office 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 OES 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 OES 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, OES coordinates with federal agencies, such as the Department of Homeland Security and Federal Emergency Management Agency, as well as other state and local agencies such as the California Highway Patrol.

In May 2005, the OES released the 2005-2010 Statewide Emergency Management Strategic Plan, which outlines California's vision, mission, principles for emergency management, as well as goals and objectives for the period of 2005-2010. In addition to the strategic plan, OES has released a local planning guide on terrorism, which provides guidance to local cities in planning for potential terrorist acts.6

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.

FEMA now requires state and local governments to develop hazard mitigation plans. The Disaster Mitigation Act of 2000 (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; identify 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.

6 http://www.oes.ca.gov/Operational/OESHome.nsf/Content/A566AC012F62E72E88256B7B0026D74B?OpenDocument

California is currently in the process of updating its *State of California Multi-Hazard Mitigation Plan*. 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:[7]

- 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
- 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. OES 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 3.13-1).**

National Incident Management System / Standardized Emergency Management System

The National Incident Management System (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.*[8]

7 State of California Multi Hazard Mitigation Plan (2004)

8 http://www.fema.gov/pdf/nims/NIMS_basic_introduction_and_overview.pdf

TABLE 3.13-1
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: Southern California Association of Governments, 2007

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 Standardized Emergency Management System (SEMS).[9]

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[10]
- ICS100: Introduction to Incident Command System (ICS)[11] or equivalent[12]

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.

9 http://gov.ca.gov/index.php/executiveorder/2000/
10 http://www.training.fema.gov/emiweb/is/is700.asp
11 http://www.training.fema.gov/EMIWEB/is/is100.asp
12 FEMA IS700 "NIMS, and Introduction" and ICS100 are used extensively in the development of this section

- **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.

Mutual Aid Agreements (MAA)

Immediately following the 1994 Northridge earthquake, city and county emergency managers in the 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.
- Promoting professionalism in emergency management.[13]

[13] http://www.oes.ca.gov/Operational/OESHome.nsf/PDF/Emergency Managers Mutual Aid Plan/$file/Emma.pdf

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

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.[14]

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.

Intelligent Transportation Systems (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.

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 Intelligent Transportation System (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

[14] http://www.tfhrc.gov/pubrds/04nov/02.htm

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

The Strategic Highway Network (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. SR14, SR101 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. An unclassified visual representation of the STRAHNET within the SCAG region is displayed in Map 3.13-1. in the Map Chapter.

Methodology

This section summarizes the methodology used to evaluate the expected impacts on security and emergency preparedness associated with implementation of the proposed 2008 RTP. Significant threats include earthquakes, wildfires, flooding, mudslides, and more recently, terrorism has been added to the list of threats that the region must prepare against.

An evaluation of whether the 2008 RTP will adversely impair security and emergency preparedness in the region is provided. Mitigation measures are provided to minimize those effects identified as significant adverse effects.

Comparison with the No Project

The analysis of security and emergency preparedness 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 comparison to existing conditions); however, it provides a meaningful perspective on the expected effects of the 2008 RTP.

Determination of Significance

The methodology for determining significance applies the significance criteria below to compare the existing conditions to the expected future conditions with the Plan.

Significance Criteria

Security and Emergency Preparedness is not specifically included in the CEQA Guidelines, with the exception of wildfire threat. Therefore, the criteria for determining significance of impacts were developed using the goals and objectives outlined in SCAG's Security and Emergency Preparedness chapter of the 2008 RTP. Implementation of the proposed Plan would have a significant impact if it would:

- Impair transportation safety, security, and reliability for all people and goods in the region; and
- Prohibit the prevention, protection, response to, and recovery from major human-caused or natural events that would create a significant hazard to the public threatening and impacting lives, property, the transportation network and the regional economy.
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Impacts and Mitigation Measures

Implementation of the 2008 RTP would affect the security and emergency preparedness in the region due to the vast expanse of transportation infrastructure. It would be physically and financially impossible to protect all transportation systems from natural disaster or human caused incidents. However, a number of plans, programs, organizations and infrastructure are in place within the SCAG region to provide safety and security of the regional transportation system for many potential situations.

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.

Impact 3.13-1: Implementation of the 2008 RTP could impair transportation safety, security, and reliability for people and goods in the region.

The SCAG region includes approximately 18 million residents and comprises half of California's population. This region remains one of the largest economic engines in the United States and the world. In the SCAG region, transportation infrastructure also encompasses a vast system, which includes 10,683 freeway lane miles; 5,565 buses providing services in the six-county region; a metro rail system that encompasses 73 miles and 65 stations. Additionally, there are numerous aviation facilities within SCAG. The 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 AFB), March Inland Port (joint use with March Air Reserve Base), Southern California Logistics Airport (formerly George AFB) and Palmdale Airport (joint use with Air Force Plant 42).

While the RTP would generally seek to improve the efficiency of the transportation system, the addition of 5.14 million people to the region along with increased development would expose an increased number of people to risks associated with the transportation system.

The region's expansive urban form makes travel critical to daily life. A failure in the transportation system as a result of natural disaster or human-caused event would bring significant disruptions to the quality of life of many individuals. As described in this chapter, there are a number of plans, programs, organizations and infrastructure in place within the SCAG region to provide safety and security of the regional transportation system for many potential situations. All transportation sectors are subject to adhere to numerous laws and regulations at all levels of government associated with security and emergency preparedness. Also, the SCAG region has various emergency preparedness and response plans because of the region's history with earthquakes, wildfires, flooding and mudslides. However, due to the vast nature of the region, there is the potential for impacts to the security of the region. Much of the funding for safety and security programs is provided in response to changing circumstances by local, state and federal agencies. It is assumed that this circumstance would continue in to the future. Nonetheless the SCAG region is subject to and will continue to be subject to a number of natural and potential man-made risks, thus exposing residents in the region to these risks. Therefore, this impact would be **significant**.

Mitigation Measures

MM-SEP.1: SCAG shall help ensure the rapid repair of transportation infrastructure in the event of an emergency.

- SCAG, in cooperation with local and state agencies, shall identify critical infrastructure needs necessary for: a) emergency responders to enter the region, b) evacuation of affected facilities, and c) restoration of utilities.

- SCAG shall establish transportation infrastructure practices that promote and enhance security.

MM-SEP.2: SCAG shall continue to promote the use of intelligent transportation system technologies that enhance transportation security.

- SCAG shall 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.

Significance after Mitigation

Due to the geographic span and complexity of the SCAG region, the impact on transportation safety, security, and reliability for all people and goods in the region would remain significant.

Impact 3.13-2: The RTP has the potential to inhibit the prevention, protection, response to, and recovery from major human-caused or natural events that could create a significant hazard to the public threatening and impacting lives, property, the transportation network and the regional economy.

The Security and Emergency Prepared goals outlined in the 2008 RTP aim to assist the region in the planning, preparation and response to emergencies, whether caused by natural or human elements. Additionally, the 2008 RTP identifies coordination strategies SCAG would undertake in the event of major disasters, either human caused or natural. However, the unexpected and complex nature of 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. Additionally, the interdependency of the jurisdictions and organizations makes regional cooperation and coordination a significant challenge to security and emergency preparedness. The increase in population in the region would result in more people being exposed to risk. This impact would therefore be **significant**.

Mitigation Measures

SCAG does not have the authority under statute to undertake a first response or emergency management role. SCAG seeks to become a conduit for coordination and collaboration among these stakeholders at the regional level.

MM-SEP.3: 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 Department of Homeland Security grant projects, to enhance the regional transit security strategy (RTSS).
- SCAG should 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 should establish a Transportation Security Working Group (TSWG) with goals of RTP consistency with RTSS, and to find ways SCAG programs can enhance RTSS.

MM-SEP.4: SCAG shall establish a forum where policy makers can be educated and regional policy can be developed

- SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety security policies.

MM-SEP.5: 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-SEP.6: 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.

- 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-SEP.7: SCAG shall work to enhance emergency preparedness awareness among public agencies and with the public at large.

- SCAG shall work with local officials to develop regional consensus on regional transportation safety, security, and safety security policies.

MM-SEP.8: 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.

- SCAG shall encourage and provide a forum for local jurisdictions to develop mutual aid agreements for essential government services during any incident recovery

MM-SEP.9: SCAG shall help to enhance the capabilities of local and regional organizations, including first responders, through provision and sharing of information.

- 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-SEP.10: SCAG shall provide the means for collaboration in planning, communication, and information sharing before, during, or after a regional emergency.

- 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 should 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.

Significance after Mitigation

Due to the geographic span and complexity of the SCAG region, this impact would remain **significant**.

Impact 3.13-3: The RTP could result in exposing people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

The proposed project area in the SCAG region contains both wildlands and urbanized areas that have the potential to expose people or structures to a significant risk of loss, injury or death involving wildland fires. Wildland fires have increased as more development has occurred in wildfire prone areas. These wildland/urban interface (WUI) areas, the area where houses meet or intermingle with undeveloped wildland vegetation, expose people and structures to loss, injury, and/or death.[15] The 2008 RTP includes the addition of 5.14 million people to the region by 2035. It would include land use strategies that would focus development in existing centers and discourage dispersed patterns of development that would put people and houses at risk of fire threat. However, due to the amount of buildable land and the meterology of the region, it is anticipated that homes would continue to be built in areas where wild fire threats exist. **Table 3.13-1** shows existing and future number of homes exposed to fire hazard. The RTP would allow improved access to areas that currently have more limited access, thereby potentially increasing homes in more remote areas exposed to fire hazard. However, because the RTP would encourage a more compact landform fewer homes would be built in areas exposed to fire hazard. Because of the increase in property and people on the urban fringe this impacts would be considered **significant**.

Mitigation Measures

MM-SEP.11: SCAG shall discourage development, or encourage the use of special design requirements, in areas with steep slopes, high fire, flood, and seismic hazards.

MM-SEP.12: SCAG shall maintain Buffer Zones or natural areas for adequate protection of lives and properties against natural and man-made hazards.

MM-SEP.13: SCAG shall discourage development on potentially hazardous developments in hillsides, canyons, areas susceptible to flooding, earthquakes, wildfire and other known hazards, and areas with limited access for emergency equipment.

MM-SEP.14: SCAG 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-SEP.15: SCAG shall 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.

[15] U.S. Fire Administration: *Wildland Fires: A Historical Perspective*. (December 2001). Available at: http://www.usfa.dhs.gov/downloads/pdf/tfrs/v1i3-508.pdf

MM-SEP.16: SCAG 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.

Significance after Mitigation

The mitigation measures would assure that the number of people or structures exposed to fire threat would be minimized. The impact after mitigation would be **less than significant**.

Cumulative Impact 3.13-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable fire threat to development in the SCAG region.

Mountains and forests ring the Los Angeles Basin. As development encroaches on these natural lands, homes and businesses encroach on areas that are susceptible to wild fires. Today, approximately 809,000 households live in areas that are classified as high, very high, or extreme threat of wild fires, based on analysis of SCAG household data and data from the CDF's, Fire and Resource Assessment Program. With the 2008 RTP approximately 1,064,496 households would be in areas classified as high, very high or extreme fire threat. **Table 3.13-1** depicts the wild fire threat to households for the base year (2008) and the Plan. **Map 3.13-2** depicts the wild fire threat in the SCAG region.

TABLE 3.13-2:
HOUSEHOLDS EXPOSED TO WILD FIRE THREAT

	Little or No Threat	Moderate	High	Very High	Extreme
Existing	437,211	4,302,508	300,673	350,968	157,737
2035 Plan	744,148	5,900,174	381,862	477,768	204,866
2035 No Project Alternative	875,030	6,859,957	817,449	911,744	494,023

SOURCE: Southern California Association of Governments, 2007

The 2008 RTP represents an increase of approximately 255,000 additional households exposed to high to extreme wildfire threat compared to today, but a potential decrease of 1.16 million households compared to the No project Alterative. Nonetheless, both the Plan and the No Project Alternative would have a cumulatively considerable effect. Mitigation measures for the above impact would also be applied to this impact in addition to the following measures.

Mitigation Measures

MM-SEP.17: SCAG shall encourage local jurisdictions to strengthen and fully enforce fire codes and regulations.

MM-SEP.18: SCAG shall encourage the use of fire-resistant materials when constructing projects in areas with high fire threat.

MM-SEP.19: SCAG shall encourage 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-SEP.20: SCAG shall encourage reduction of fire threats in the region as part of the Compass Blueprint process and as part of other on-going regional planning efforts

MM-SEP.21: Project implementation agencies shall 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) 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-SEP.22: Project implementation agencies shall 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.

Significance after Mitigation

The impact would remain significant because development would occur in areas that have a high, very high, or extreme threat of fire.

Comparison with the No Project

The 2035 regional total population, households and employment is expected to be the same for the No Project Alternative and the proposed 2008 Plan. The growth distribution would differ from the expected distribution supported by implementation of the 2008 RTP. The No Project Alternative does not include land-use-transportation measures and includes fewer transportation projects. As a result, the Plan and the No Project Alternative provide differing mobility, and different employment and housing options, resulting in different distributions of growth in 2035.

Direct Impacts

The 2008 RTP includes expenditures of $10 billion for safety related projects and services, that would not be available under the No Project. This is in addition to safety standards considered as part of every project design. As a result, implementation of the Plan is anticipated to minimize the

threat and impact to lives, property, the transportation network and the regional economy, as compared to the No Project alternative.

The No Project impacts would be greater than the 2008 RTP for impacts for Impact 3.13-1, 3.13-2, and 3.13-3.

Cumulative Impacts

The 2008 RTP includes land use strategies that emphasize compact development and discourage the consumption of land on the urban fringe, where wildfire threat is the greatest. In total, the No Project would result in approximately 655,000 acres consumed compared to 200,000 under the Plan. It is anticipated that the spread out land use patterns of the No Project Alternative would expose more structures to wild fire threat.

The No Project Alternative's cumulative impacts security and emergency preparedness would be greater than the 2008 RTP.

References – Security and Emergency Preparedness

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3.14 Transportation

This chapter describes the current transportation system in the SCAG region, discusses the potential impacts of the RTP on transportation, identifies mitigation measures for the impacts, and evaluates the residual impacts.

Environmental 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 and rail, freight railroads, 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. Non-motorized transportation modes, such as bicycles share many of these facilities. The regional public transit system includes local shuttles, municipal and area-wide public bus operations, rail rapid 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 serve the function of transfer, storage and distribution of goods. The transportation system supports the region's economic needs as well as the demand for personal travel.

The regional transportation system is currently at capacity operations during peak periods. The highway system shows substantial freeway congestion in the morning and evening peak period, with random episodes of incident-related (i.e. accident) congestion throughout the day. The transit system is experiencing substantial overcrowding on a number of core urban bus routes with significant excess capacity on most off-peak and peripheral routes. Rail transit is very close to capacity during peak hours on the Metro Blue Line, Metro Red Line, and Metro Gold Line, while the Metro Green Line generally has some capacity available. Commuter rail service is at or near capacity during peak periods as the routes approach Union Station in downtown Los Angeles, but suburb-to-suburb capacity is available on most lines.

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 3.14-1 identifies local, state and federal governmental agencies that participate in the development of the Regional Transportation Plan. Seven major entities and agencies are involved

TABLE 3.14-1
PARTIES DIRECTLY INVOLVED IN THE DEVELOPMENT OF THE REGIONAL TRANSPORTATION PLAN

County Transportation Commissions / Transportation Sales Tax Commission		
Imperial (IVAG)	Orange (OCTA)	San Bernardino (SanBag)
Los Angeles (LACMTA)	Riverside (RCTC)	Ventura (VCTC)

Subregions/ Councils of Governments	
Arroyo Verdugo Cities	Orange County COG
Coachella Valley Association of Governments	San Bernardino County Associated Governments
Gateway Cities COG	San Gabriel Valley Association of Governments
Imperial Valley Association of Governments	South Bay Cities COG
Las Virgenes-Malibu-Conejo COG	Ventura County Council of Governments
City of Los Angeles	Western Riverside County COG
North Los Angeles	Westside Cities COG

Local and County Implementing Agencies	
Caltrans District Offices	Port Authorities
Airport Authorities	Transit / Rail Operators
Other Owners, Operators and Implementing Agencies	

Resource / Regulating Agencies	
US Department of Transportation • Federal Aviation Administration • Federal Highway Administration • Federal Railroad Administration • Federal Transit Administration	US Environmental Protection Agency California Air Resources Board California Department of Transportation California Environmental Protection Agency Air Districts in SCAG Region

Tribal Governments	
Agua Caliente Band of Cahuilla Indians	Morongo Band of Mission Indians
Augustine Band of Mission Indians	Pechanga Band of Luiseno Indians
Cabazon Band of Mission Indians	Ramona Band of Mission Indians
Cahuilla Band of Mission Indians	San Manuel Band of Mission Indians
Chemehuevi Reservation	Santa Rosa Band of Mission Indians
Colorado River Reservation	Soboba Band of Luiseno Indians
Fort Mojave Indian Tribe	Torres-Martinez Desert Cahuilla Indians
Fort Yuma Reservation	Twentynine Palms Band of Mission Indians

Other private, Non-profit organizations, interest groups and Tribal Nations

SOURCE: SCAG 2007 *Draft 2008 Regional Transportation Plan*, Los Angeles, CA.

including SCAG as the designated Metropolitan Planning Organization (MPO), the County Transportation Commissions (CTCs), Sub-regional Councils of Governments (COGs), 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.

Each of the six counties in the SCAG region has a Transportation Commission or Authority with the exception of Imperial County, where the Imperial Valley Association of Governments (IVAG) serves as the regional countywide transportation agency. 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 subregions (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.

Congestion Management Programs (CMP)

In order to meet federal certification requirements, SCAG and the county Congestion Management Agencies (CMAs) have worked together to develop a Congestion Management Program (CMP) process for the region. In the SCAG region, the CMS is comprised of the combined activities of the RTP, 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 and the RTIP by the Imperial Valley Associated Governments (IVAG).

Congestion Management Process

In addition to SCAG's RTP 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.

a) 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.

b) Multi-Modal Performance – In addition to highway performance, each CMP contains an element to evaluate the performance of other transportation modes including transit.

c) Transportation Demand Management (TDM) – Each CMP contains a TDM component geared at reducing travel demand and promoting alternative transportation methods.

d) Land Use Programs and Analysis – Each CMP incorporates a program for analyzing the effects of local land use decisions on the regional transportation system.

e) 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.

f) 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 the respective air quality management district.

Commute Patterns and Travel Characteristics

The existing transportation network serving the SCAG region supports the movement of people and goods. On a typical day in the 5-county region (excluding Imperial County), the transportation network supports a total of approximately 380.3 million vehicle miles of travel (VMT) and 12.5 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 five counties is presented in **Table 3.14-2**.

Much of the existing travel in the SCAG region takes place during periods of congestion, particularly during the morning and evening peak periods (defined as 6:00 AM to 9:00 AM and 3:00 PM to 7:00 PM, respectively). 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 3.14-3** presents the existing (2008) travel delays and percent of regional VHT in delay by County on freeways and arterials. As shown in **Table 3.14-3,** regional travel time in delay represents approximately 30% of all daily, 33% of all AM peak period, and 42% 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 8.9 miles in Imperial County to a high of 17.3 miles in San Bernardino County). 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.

TABLE 3.14-2
SUMMARY OF EXISTING (2008) 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	1,203,002	1%	1,974,330	1%	5,951,285	1%	26,799	1%	42,908	1%	125,695	1%
Los Angeles	44,097,050	51%	74,275,694	51%	218,664,857	51%	1,661,703	56%	3,408,044	58%	7,939,505	56%
Orange	14,960,934	17%	24,924,680	17%	73,375,213	17%	540,337	18%	1,008,980	17%	2,448,238	1%
Riverside	10,160,449	1%	16,491,836	11%	50,871,194	12%	300,262	10%	576,603	10%	1,441,957	10%
San Bernardino	12,172,756	14%	10,160,449	7%	61,144,294	14%	335,406	11%	618,136	11%	1,607,071	11%
Ventura	3,983,646	5%	6,566,736	5%	19,171,558	4%	117,949	4%	223,796	4%	555,626	4%
Total	86,577,837	100%	144,287,611	100%	429,178,401	100%	**2,982,456**	100%	**5,878,467**	100%	**14,118,092**	100%

SOURCE: SCAG 2007 *Regional Travel Demand Model.* SCAG, Los Angeles, CA

TABLE 3.14-3
SUMMARY OF EXISTING (2008) 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	3,153	4,394	10,119	12%	10%	8%	8.88	13.57	46.87
Los Angeles	589,639	1,544,152	2,666,137	35%	45%	34%	12.27	27.6	55.55
Orange	192,894	417,076	752,942	36%	41%	31%	11.39	23.9	59.82
Riverside	88,386	227,588	390,042	29%	39%	27%	16.53	32.6	61.84
San Bernardino	83,691	196,849	349,615	25%	32%	22%	17.33	34.9	65.66
Ventura	30,356	77,335	132,075	26%	35%	24%	13.46	25.9	74.07
Total	**988,119**	**2,467,394**	**4,300,930**	33%	42%	30%	13.1	27.8	56.47

SOURCE: SCAG 2007 Regional Travel Demand Model. SCAG. Los Angeles, CA.

Map **3.14-1** in the map section at the end of this document 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 10% in Imperial County to a high of 45% in Los Angeles County, as indicated in **Table 3.14-3**.

Based on average accident rates provided by Caltrans, transportation-related fatalities occur at an overall rate of 1.2 fatalities per one hundred million passenger 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 3.14-4**, below.

TABLE 3.14-4
TOTAL VEHICLE FATALITIES, 2005

County	Fatalities	Fatalities per 100 million Vehicle Miles Traveled	Vehicle Miles Traveled (100 millions)
Highways			
Imperial	46	2.6	17.8
Los Angeles	745	1.0	779.7
Orange	205	0.8	252.9
Riverside	333	2.1	157.7
San Bernardino	425	2.2	195.2
Ventura	71	1.1	67.0
Total SCAG Region	1,825	1.2	1,470.3
Transit			
Imperial	0	–	–
Los Angeles	12	11.3	1.06
Orange	0	–	0.33
Riverside	0	–	0.10
San Bernardino	0	–	0.11
Ventura	0	–	0.02
Metrolink	11	122.2	0.09
Total SCAG Region	23	13.4	1.71

SOURCE: SCAG 2007.

Of the current total daily trips in the SCAG region, approximately 33.9% are a.m. trips, likely home to work trips. Unlike personal trips, commute trips are generally non-discretionary; i.e., they must be made at a specific time and to a specific location. The current average home-to-work trip in the region is 13.7 miles long. A summary of home-to-work trip characteristics by county is also presented in **Table 3.14-5**.

Public transit in all forms (including school buses) carries approximately 2.7% 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 4.04% of all home-to-work trips in the region, as detailed in **Table 3.14-5.**

TABLE 3.14-5
EXISTING (2008) 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	77.25%	5.74%	1.49%	9.37%	0.20%	5.95%	100.00%
	All Daily Trips	41.58%	11.22%	6.12%	26.45%	1.32%	13.31%	100.00%
Los Angeles	Home-Work/Univ	70.14%	6.28%	1.64%	10.27%	6.68%	5.00%	100.00%
	All Daily Trips	39.77%	11.23%	6.31%	27.11%	3.40%	12.17%	100.00%
Orange	Home-Work/Univ	79.01%	4.94%	1.29%	8.09%	2.14%	4.53%	100.00%
	All Daily Trips	44.86%	10.36%	5.93%	25.30%	1.96%	11.60%	100.00%
Riverside	Home-Work/Univ	76.83%	5.57%	1.76%	9.88%	0.99%	4.96%	100.00%
	All Daily Trips	40.85%	10.66%	7.00%	28.25%	1.55%	11.69%	100.00%
San Bernardino	Home-Work/Univ	74.91%	5.99%	2.00%	10.90%	1.50%	4.71%	100.00%
	All Daily Trips	39.87%	11.06%	7.18%	29.10%	1.81%	10.97%	100.00%
Ventura	Home-Work/Univ	81.10%	4.51%	1.35%	7.80%	0.73%	4.52%	100.00%
	All Daily Trips	45.43%	9.89%	6.04%	25.06%	1.36%	12.22%	100.00%
Total of 6 Counties	Home-Work/Univ	73.61%	5.83%	1.60%	9.74%	4.35%	4.86%	100.00%
	All Daily Trips	41.09%	10.93%	6.40%	27.02%	2.66%	11.90%	100.00%

SOURCE: SCAG 2007 *Regional Travel Demand Model*, Los Angeles, CA

Regional Freeway, Highway, and Arterial System

Regional Freeway and Highway System

The regional freeway and highway system shown in **Map 3.14-2** in the map section at the end of this document 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 3.14-6**.

TABLE 3.14-6
EXISTING (2008) REGIONAL FREEWAY ROUTE MILES AND LANE MILES BY COUNTY

County	Freeway Route Miles	Freeway Lane Miles
Imperial	93	373
Los Angeles	639	4,624
Orange	169	1,277
Riverside	309	1,692
San Bernardino	464	2,337
Ventura	94	501
SCAG total	**1,768**	**10,804**

SOURCE: SCAG 2007 Regional Travel Demand Model. Los Angeles, CA.

Regional 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. 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 2 or 3 persons. Many include on-line and off-line park & 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 3.14-7**.

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 219 park and ride lots in the SCAG region, including Metrolink station parking lots. These facilities include: 34 park and ride facilities in Orange County, 124 in Los Angeles County, 21 in Riverside County, 18 in San Bernardino County and 22 in Ventura County.[1]

[1] SCAG. (2002). *Park and Ride Inventory*. Los Angeles, CA.

TABLE 3.14-7
EXISTING (2008) REGIONAL HIGH OCCUPANCY VEHICLE (HOV) ROUTE MILES AND LANE MILES BY COUNTY

County	HOV Centerline Miles	HOV Total Lane Miles
Imperial	0	0
Los Angeles	228	451
Orange	112	216
Riverside	38	64
San Bernardino	41	83
Ventura	0	0
SCAG total	**420**	**815**

SOURCE: SCAG 2007 Regional Travel Demand Model. Los Angeles, CA.

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 **Table 3.14-8**.

TABLE 3.14-8
EXISTING (2008) REGIONAL ARTERIAL ROUTE MILES AND LANE MILES BY COUNTY

County		Route Miles	Lane Miles
Imperial	Principal Arterials	105	401
	Minor Arterials	333	677
Los Angeles	Principal Arterials	2,206	8,665
	Minor Arterials	2,954	9,213
Orange	Principal Arterials	658	3,169
	Minor Arterials	870	3,126
Riverside	Principal Arterials	337	1,207
	Minor Arterials	1,110	3,097
San Bernardino	Principal Arterials	598	1,948
	Minor Arterials	1,564	4,160
Ventura	Principal Arterials	257	892
	Minor Arterials	359	993
SCAG total	Principal Arterials	**4,161**	**16,282**
	Minor Arterials	**7,190**	**21,266**

SOURCE: SCAG 2007 Regional Travel Demand Model. Los Angeles, CA.

Public Transit

In Southern California public transit service is comprised of local and express buses, 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 30 separate public agencies. Ten of these agencies provide 93 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.

Metro 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 3.14-9**.

TABLE 3.14-9
KEY STATISTICS FOR MAJOR TRANSIT OPERATORS (2005)

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	970 (est)	258,642	414,683	16.0%
Los Angeles	Metro	1,180,699	377,268,411	92,504,490	30.1%
Orange	OCTA	217,310	67,304,135	32,700,809	25.8%
Riverside	RTA	23,963	7,139,831	9,787,847	20.0%
San Bernardino	Omnitrans	51,619	15,038,153	11,461,994	19.4%
Ventura	Gold Coast Transit	10,225	3,145,890	1,943,740	20.7%
Metro Rail - Subway					
Los Angeles	Metro	111,206	36,272,621	5,876,509	22.1%
Metro Rail - Light Rail					
Los Angeles	Metro	116,497	37,970,291	8,114,242	15.8%
Regional Commuter Rail					
Various	SCRRA (Metrolink)	40,147	10,693,327	9,004,597	43.2%

SOURCE: SCAG 2007

Many people depend on reliable transit service to participate in the economic, cultural and social benefits of Southern California. Transit ridership has increased in absolute numbers, from an all time low in 1995 to an all time high in 2006 (approximately 740 million annual boardings).[2] The recent upward trend can be partially credited to new urban rail system service expansions and the introduction and expansion of Metrolink, the region's commuter rail service.

The largest provider of public transit service in Imperial County is Imperial Valley Transit which serves the cities of Brawley, Imperial, IVC, El Centro, Heber and Calexico. There are approximately

[2] SCAG (2007) Transit Data Collection.

15 routes with multiple trips daily Monday through Friday and a reduced schedule on Saturdays. It is estimated that there were 970 average weekday boardings in 2005, and 16% of the system's operating expenses were recovered through passenger fares.

The largest provider of public transit service in Los Angeles County is the Los Angeles County Metropolitan Transportation Authority (Metro), which carries the majority of total transit patrons in the region (over 1.4 million average weekday boardings). 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.

The largest provider of public transit service in Orange County is the Orange County Transportation Authority (OCTA), which operates more than 400 buses on over 70 local and express routes throughout the urbanized portions of Orange County. In 2005, the system experienced approximately 217,000 average weekday boardings, and 26% of the system's operating expenses were recovered through passenger fares.

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 buses on approximately 40 local and express routes. In 2005, the system experienced approximately 217,000 average weekday boardings (including bus and paratransit boardings), and 20% of the system's operating expenses were recovered through passenger fares.

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 the San Bernardino Valley. It operates a fleet of more than 218 buses over approximately 35 routes. In 2005, the system experienced approximately 52,000 average weekday boardings and 19% of the system's operating expenses were recovered through passenger fares.

The largest provider of public transit service in Ventura County is Gold Coast Transit, which provides bus and paratransit services in the western portion of the county with the cities of Ojai, Oxnard, Port Hueneme, San Buenaventura and the unincorporated areas. It operates a fleet of more than 40 buses over approximately 16 routes. In 2005, the system experienced approximately 10,000 average weekday boardings, and 21% of the system's operating expenses were recovered through passenger fares.

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 El Segundo 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 (shown in **Map 3.14-3** in the map section at the end of this document), and the Metro Gold Line which runs from Union Station to Pasadena.

The Metro Rail system is operated seven days a week. A system total of 17 route miles of subway (Metro Red Line) and 55 route miles of light rail serves a total of 65 stations (as of mid-2003). Ridership on the Metro Rail system exceeded 74 million boardings in 2005.3

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 four lines. Service on the initial system was greatly expanded after the 1994 Northridge earthquake. Currently (2005) SCRRA operates 7 routes including five from downtown Los Angeles to Oxnard, Lancaster, San Bernardino, Riverside, and Oceanside, from San Bernardino to Irvine, and from Riverside via Fullerton to downtown Los Angeles. As of September 2007, the system operated 145 trains on weekdays, 48 on Saturdays and 32 on Sundays to 55 stations on 512 route miles. Average weekday ridership is approximately 40,147 passengers.[4]

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 30 trains (combined weekday and weekend service) from Los Angeles Union Station. Additionally, Amtrak operates three interstate routes within the region (Sunset Limited, Southwest Chief and Texas Eagle) operating an average of 4 trains per day. These regional commuter rail lines are shown in Map 3.14-3 in the map chapter at the end of this document.

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.

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

3 Los Angeles Metropolitan Transportation Authority. (2007). http://www.metro.net/news_info/facts.htm, and http://www.mta.net/trans_planning/construction/gold_line.htm. Accessed May 2003.

4 Southern California Regional Rail Authority. (2007).

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 and Santa Fe Railway Co. (BNSF) and the Union Pacific Railroad (UP). These railroads link Southern California with other U.S. regions, Mexico and Canada either directly or via their connections with other railroads. They also provide freight rail service within California. In 2003, railroads moved approximately 155 million tons of cargo throughout California. [5]

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 2000, the Colton Crossing saw on average 90 freight trains per day on the BNSF San Bernardino Line, and 31 freight trains per day on the UP line. By 2010, these numbers are projected to increase by 50%, with an average of 137 BNSF freight trains and 45 UP trains transiting the Colton Crossing on a daily basis.

[5] Calculated from data provided in: LAEDC. (2005). *California Investment Guide*. Los Angeles, CA.

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 2006, an average of 55 intermodal trains per day transited the Alameda Corridor, an approximate increase of 15% since 2005.

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 the Golden State Freeway (1-5) with the Foothill Freeway (I-210) and the Antelope Valley Freeway (SR-14) and at the junction of the San Diego Freeway (I-405) with the Harbor Freeway (I-110). In addition, truck climbing lanes are located on northbound I-5 in northern Los Angeles County.[6]

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 Ontario. In 2008, approximately 1.2 million daily heavy-duty truck trips occur in the SCAG region (2.4% of all vehicle trips). Approximately 27% of all heavy-duty truck travel occurs in delay.[7]

Maritime Ports

Southern California is served by three major deep-water seaports. These ports—Hueneme, Long Beach and Los Angeles—accommodate 120 weekly vessel strings handling 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 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 351 million metric tons of cargo in 2006.[8]

6 *Goods Movement Truck and Rail Study*, (2003). SCAG. Los Angeles, CA.
7 Year 2003 Model Validation Summary of the Regional Transportation Model. (2007). SCAG. Los Angeles, CA.
8 Port of Los Angeles 2006 Financial Statement; and Port of Long Beach 2006 Monthly Tonnage Summary Report.

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 15.8 million Twenty-foot Equivalent Units (TEUs) of containers in 2006.[9] Together these two ports rank third in the world, behind Rotterdam and Hong Kong, as the busiest maritime ports.

Non-Motorized Transportation Network

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 2008 biking and walking accounts for approximately 11.9 percent of total trips and 4.9 percent of trips to work or university from home.[10]

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 2,500 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.[11] The City of Los Angeles alone has more than 500 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.

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.

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 in Map 3.14-4 in the map section at the end of this document) handle the majority of passenger air traffic. They are:

- Bob Hope Airport
- Imperial County*
- John Wayne/Orange County
- Long Beach
- Los Angeles International
- Ontario International
- Oxnard*
- Palm Springs International

**limited commercial service*

In all, some 88 million annual passengers (MAP) were served in the region in 2005, more than double the number served in 1980. The level of air passenger demand is forecast to be approximately 164 MAP by 2035. While none of the individual airports is the largest in the U.S., the

9 Growth of California Ports – Opportunities and Challenges, A Report to the Legislature, April 2007.
10 SCAG 2007, Regional Travel Demand Model Results. Los Angeles, CA.
11 SCAG Draft 2008 Regional Transportation Plan.

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 3.14-10**. 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 3.14-10
EXISTING (2005) ACTIVITY AT MAJOR COMMERCIAL AIRPORTS IN THE SCAG REGION

	Burbank	John Wayne	Long Beach	Los Angeles	Ontario	Palm Springs	Regional Total
Passenger Volume (,000)	5,512	9,627	3,034	61,489	7,214	1,420	88,296
Percent of Regional Total	6.2%	10.9%	3.4%	69.6%	8.2%	1.6%	100%
Cargo Volume (tons)	52,867	24,073	54,298	2,136,661	576,791	75	2,844,765
Percent of Regional Total	1.9%	0.8%	1.9%	75.1%	20.3%	0.0%	100%
Annual Operations	135,630	349,940	353,011	650,629	143,249	92,853	1,725,312
Average Daily Operations	372	959	967	1,783	392	254	4,727
Percent of Regional Total	7.9%	20.3%	20.5%	37.7%	8.3%	5.4%	100%

SOURCE: Collected from the various airports (2007). SCAG. Los Angeles, CA.

Los Angeles International Airport

Los Angeles International Airport (LAX), as shown in **Map 3.14-4** in the map chapter at the end of this document, is located in the southwestern portion of the City of Los Angeles, bordered by Arbor Vitae / Westchester Parkway to the north, Interstate 405 to the east, Interstate 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 Interstate 405 and Interstate 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.

Ontario International Airport

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 3.14-4 in the map chapter at the end of this document. Major access routes include Interstate 10 and State Route 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 Interstate 405, one mile east of State Route 55, and one mile north of State Route 73, as shown in **Map 3.14-4** in the map chapter at the end of this document. 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 Interstate 5, three miles east of State Route 170, and three miles north of State Route 134, as shown in **Map 3.14-4** in the map chapter at the end of this document. 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 Interstate 405, and three miles west of Interstate 605, and three miles east of Interstate 710, as shown in **Map 3.14-4** in the map chapter at the end of this document. Major access routes include these freeways and the major surface streets in the surrounding area, including Lakewood Boulevard (State Route 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 Interstate 10 and one mile northeast of Gene Autry Trail (State Route 111), as shown in **Map 3.14-4** in the map chapter at the end of this document. 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 State Route 138, and three miles east of State Route 14, as shown in **Map 3.14-4** in the map chapter at the end of this document. 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 Interstate 215, two miles north of Interstate 10, and one mile west and two miles south of State Route 30, as

shown in **Map 3.14-4** in the map chapter at the end of this document. 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 State Route 395, and three miles northwest of Interstate 15, as shown in **Map 3.14-4** in the map chapter at the end of this document. 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 Interstate 215 and two miles south of State Route 60, as shown in **Map 3.14-4** in the map section at the end of this document. 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.

Regulatory Setting

This section describes the federal and state legal framework within which the 2008 RTP is developed. It also provides a description of the role various governmental institutions play in shaping and using the Plan.

Federal Agencies and Regulations

Under the SAFETEA-LU, the U.S. Department of Transportation (USDOT) requires that the MPOs prepare long range transportation plans. In federally designated non-attainment and maintenance areas, these plans must be updated every four years. SCAG adopted the 2004 RTP in April 2004, and amended it three times, the last being in June 2007. The 2008 RTP is an update to the 2004 RTP and it replaces the 2004 RTP in its entirety.

The federal requirements for regional transportation plans include the following key provisions:

- Plans must be developed through an open and inclusive process that ensures public input and seeks out and considers the needs of those traditionally under served by existing transportation systems.
- Plans must be for a period not less than 20 years into the future.
- Plans must reflect most recent assumptions for population, travel, land use, congestion, employment, and economic activity.
- Plans must be financially constrained and revenue assumptions must be reasonable in that they can be expected to be available during the time frame of the plan.

- Plans must conform to the applicable State Implementation Plans (SIPs).
- Plans must consider projects and strategies, in the local context, that will:
    1. support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
    2. increase the safety of the transportation system for motorized and nonmotorized users;
    3. increase the security of the transportation system for motorized and nonmotorized users;
    4. increase the accessibility and mobility of people and for freight;
    5. protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
    6. enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
    7. promote efficient system management and operation; and
    8. emphasize the preservation of the existing transportation system.

State Agencies and Regulations

The state requirements largely mirror the federal requirements and the state has adopted extensive RTP guidelines. Key additional state requirements include the following:

- Regional transportation plans must comply with the California Environmental Quality Act (CEQA);
- The first four years of the RTP must be consistent with the four-year State Transportation Improvement Program (STIP) as incorporated into the Regional Transportation Improvement Program (RTIP);
- Program level performance measures that include objective criteria that reflect the goals and objectives of the RTP must be utilized in the development and evaluation of the RTP;
- Finally, the State guidelines also call for three specific elements of RTPs - a policy element, an action element, and a financial element.

Methodology

This section summarizes the methodology used to evaluate the expected impacts of implementation of the proposed Plan on transportation and associated environmental effects.

The methodology used in this analysis evaluates the Plan from a system-wide perspective at both the county and regional levels using SCAG's Regional Travel Demand Model. SCAG's Regional Travel Demand Model is a sophisticated chain of models that supports the development of the Regional Transportation Plan (RTP), the Regional Transportation Improvement Program (RTIP) and used as input for development of Air Quality Management Plans in the SCAG region, e.g. the South

Coast Air Quality Management Plan (AQMP). The model is a tool for comparisons among alternative transportation system configurations and associated population and employment trip distributions. It should be noted that occurrences that are common but unpredictable such as accidents, transit strikes, and other erratic variables are not included as inputs to the transportation model. Additionally, the model has a margin of error of approximately 5-15%.

Key model inputs to this SCAG model include socio-economic characteristics by Traffic Analysis Zone (TAZ) and detailed descriptions of the existing and proposed transportation networks. Both the socio-economic characteristics and the transportation networks are assumed to change over time, with future conditions including projected land use development and anticipated transportation improvements. The SCAG model covers all urbanized areas in the six-county area (Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura counties).

Comparison with the No Project

The analysis of transportation resources includes a comparison between the expected future conditions with the 2008 RTP and the expected future conditions if no plan was adopted. This evaluation is not included in the determination of the significance of impacts, however it provides a meaningful perspective on the effects and benefits of the 2008 RTP.

Determination of Significance

The significance of impacts was determined by applying the significance criteria below to compare current regional transportation conditions to expected future conditions with the Plan. The Regional Travel Demand Model, discussed above, provides performance data for future Plan conditions, and 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 2008 RTP on transportation resources.

Significance Criteria

A significant impact is defined as “a substantial or potentially substantial, adverse change in the environment” (Public Resources Code § 21068). The 2008 RTP would have a significant impact if implementation would potentially:

- Generate substantially more total daily Vehicle Miles of Travel (VMT) than the current daily VMT;
- Result in a substantially higher average Vehicle Hours Traveled (VHT) in delay and percent total VHT in delay for all trips compared to the current VHT delay;
- Result in substantially greater average delay and percent of total VHT 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; or
- Result in a substantially higher system-wide injury accident rate for all travel modes compared to the existing condition.
- Cause a cumulatively considerable adverse effect on regional transportation and associated environmental effects.

Impacts and Mitigation Measures

Implementation of the 2008 RTP would include implementation of a series of projects that are described in the Project Description (Chapter 2). As discussed in the Methodology and Significance Criteria above, the 2035 transportation system performance is compared to the performance of the existing system (2008) for the purpose of determining the significance of impacts. The RTP itself uses 2003 data to represent existing conditions. This PEIR uses SCAG forecasts to model existing (2008) conditions.

Compared to the existing condition (2008), in 2035 with the implementation of the 2008 RTP, Vehicle Miles Traveled (VMT), and Vehicle Hours in Delay (VHT) for all vehicles and for heavy-duty trucks would increase. The percent of work opportunities within 45 minutes travel time by auto or transit would increase. Fatality and injury accident rates would improve, and could improve more as the California Strategic Highway Safety Plan is implemented.

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.

Impact 3.14-1: In 2035 there would be substantially more total daily Vehicle Miles of Travel (VMT) than the current daily VMT. Implementation of the 2008 RTP would contribute to this increase.

Substantial growth and development is anticipated to occur within the region between 2008 (the RTP base year) and today and 2035. Based on SCAG's model results, average daily VMT are expected to grow from 429 million miles in 2008 to 552 million miles per day in 2035. This change constitutes a 28.5% increase over this period and includes light, medium and heavy duty vehicle VMT in all six counties.[12] The increase in VMT would be a significant impact.

The relationship between the VMT in 2035 with implementation of the 2008 RTP and without implementation of the RTP (The No Project alternative) is shown in **Table 3.14-11**. Implementation of the 2008 RTP would reduce vehicle miles of travel in 2035 from 563 million miles (without

[12] SCAG 2007 Regional Travel Demand Model Results. Los Angeles, CA.

implementation of the 2008 RTP) to 552 million miles.[13] However, for the purpose of determining the significance of this impact, conditions with the Plan must be compared to the existing setting.

TABLE 3.14-11
DAILY VEHICLE MILES TRAVELED (VMT) IN 2008 AND 2035 (IN MILLIONS)

	2008 Base Year	2035 No Project	2035 Plan
Imperial	6.0	11.6	11.4
Los Angeles	218.7	259.9	255.8
Orange	73.4	85.6	86.4
Riverside	50.9	85.1	80.5
San Bernardino	61.1	97.9	94.3
Ventura	19.2	23.3	23.2
SCAG Region	429.2	563.3	551.6

SOURCE: *SCAG. (2007). Regional Travel Demand Model Results. Los Angeles, CA.*

Mitigation Measures

Measures intended to reduce vehicle miles traveled are part of the 2008 RTP. These include: increasing rideshare and work-at-home opportunities to reduce demand on the transportation system, investments in non-motorized transportation and maximizing the benefits of the land use-transportation connection and other Travel Demand Management measures.

MM-TR.1: Beyond the currently financially and institutionally feasible measures included in the 2008 RTP, SCAG shall identify further reduction in VMT 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.TR-2: Local governments should coordinate controlled intersections so that traffic passes more efficiently through congested areas. Where traffic signals or street lights are installed, require the use of Light Emitting Diode (LED) technology.

MM.TR-3: Local governments 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.

[13] Ibid.

MM.TR-4: Local governments should create car-sharing programs. Accommodations for such programs include providing parking spaces for the car-share vehicles at convenient locations accessible by public transportation.

MM.TR-5: Local governments 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.TR-6: Local governments should encourage bicycling and walking by incorporate 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.

Significance after Mitigation

Implementation of measures beyond those institutionally and economically feasible measures identified in the 2008 RTP would be expected to reduce VMT, however even with this mitigation, the 2035 VMT would be substantially greater than the existing VMT. Therefore, the increase in VMT would remain a **significant impact.**

Impact 3.14-2: In 2035 there would be substantially higher average Vehicle Hours Traveled (VHT) in delay than the current condition. Implementation of the 2008 RTP would contribute to this increase.

As detailed in **Table 3.14-12**, total daily VHT in delay are expected to grow from 14.1 million person-hours in 2008 to 19 million person-hours in 2035. This constitutes a 35% increase from conditions in 2008 and includes light, medium and heavy VHT in all six counties.[14] The increase in daily VHT spent in delay would be a significant impact.

Vehicle Hours in delay for heavy-duty trucks also show an increase when compared to 2008; a 168% increase with the No Project Alternative and a 111% increase with the Plan.

Mitigation Measures

Measures intended to reduce vehicle hours of delay are part of the 2008 RTP. 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. Further reduction in VHT in delay would be obtained through the measure described for **Impact 3.14-1**.

[14] SCAG. (2007). *Regional Travel Demand Model Results.* Los Angeles, CA.

TABLE 3.14-12
DAILY HOURS OF DELAY (VHT) IN 2008 AND 2035 (IN MILLIONS)

	2008 Base Year	2035 No Project	2035 Plan
All Vehicles and Trucks VHT in Delay (person-hours)			
Imperial	0.1	0.3	0.3
Los Angeles	7.9	10.2	9.7
Orange	2.4	3.1	3.1
Riverside	1.4	3.4	2.7
San Bernardino	1.6	3.2	2.6
Ventura	0.6	0.8	0.7
Regional	14.1	21.0	19.0
Heavy Duty Trucks VHT in Delay (vehicle-hours)			
Imperial	0.001	0.003	0.002
Los Angeles	0.122	0.244	0.217
Orange	0.034	0.061	0.057
Riverside	0.024	0.117	0.078
San Bernardino	0.032	0.154	0.098
Ventura	0.007	0.015	0.014
Regional	0.221	0.593	0.467

SOURCE: SCAG. (2007). *Regional Travel Demand Model Results*. Los Angeles, CA.

Significance after Mitigation

Implementation of measures beyond those institutionally and economically feasible measures identified in the 2008 RTP would be expected to reduce VHT spent in delay for all vehicles, however even with this mitigation, the 2035 total vehicle VHT in delay would be substantially greater than the existing VHT in delay. Therefore, the increase in total vehicle VHT in delay would remain a **significant impact.**

Impact 3.14-3: In 2035 there would be substantially greater average daily VHT in delay for heavy-duty truck trips than the current condition. Implementation of the 2008 RTP would contribute to this increase.

As detailed in **Table 3.14-12**, total daily heavy-duty truck trip VHT in delay are expected to increase from 221,000 average daily heavy-duty truck vehicle hours of delay in 2008 to 467,000 hours in

2035. This constitutes a 113% increase from conditions in 2008.[15] The increase in daily heavy-duty truck trip VHT spent in delay would be a significant impact.

For the region and each county, the relationship between the daily heavy-duty truck trip daily VHT in delay with implementation of the 2008 RTP and without implementation of the RTP (the No Project alternative) are shown in Table 3.14-12. Implementation of the 2008 RTP would reduce daily heavy-duty truck hours of delay in 2035 from 593,000 hours (without implementation of the 2008 RTP) to 467,000 hours.[16] However, for the purpose of determining the significance of this impact per CEQA, conditions with the Plan must be compared to the existing setting.

Mitigation Measures

Mitigation measures intended to reduce daily heavy-duty truck vehicle hours of delay are part of the 2008 RTP. 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. Further reduction in VHT in delay for *all* vehicles would be obtained through the implementation of the measures described for **Impact 3.14-1**.

Significance after Mitigation

Implementation of measures beyond those institutionally and economically feasible measures identified in the 2008 RTP would be expected to reduce VHT spent in delay for heavy trucks, however even with additional mitigation mitigation, the 2035 heavy-duty truck VHT in delay would be substantially greater than the existing VHT in delay. Therefore, the increase in heavy-duty VHT in delay would remain a **significant impact**.

Impact 3.14-4: Implementation of the 2008 RTP would contribute to an increase in the percent of work opportunities within 45 minutes travel time by personal vehicle or by transit in 2035, relative to the existing condition.

In 2008 approximately 79% of the evening work trips take 45 minutes or less by auto and 42% occur within 45 minutes by transit. In 2035, with the implementation of the Plan, 80% of evening work trips by auto would be 45 minutes or less and 45% of transit trips would occur within 45 minutes.[17] Evening work trips are used for this measure as this is the portion of the day prone to the most delay. 45 minutes is used as a benchmark to account for reasonable commute lengths for both the auto and transit modes.

For the region and each county, the relationship between the percent of work opportunities within 45 minutes travel time with implementation of the 2008 RTP and without implementation of the RTP (No Project alternative) are shown in **Table 3.14-13**. Implementation of the 2008 RTP would increase

15 Ibid.
16 SCAG 2007 Regional Travel Demand Model Results. Los Angeles, CA.
17 Ibid.

the percent of work opportunities within 45 minutes travel time by auto in 2035 from 76% (without implementation of the 2008 RTP) to 80% (with the Plan) in 2035. The percent of work opportunities within 45 minutes travel time by transit in 2035 would increase from 40% (without the Plan) to 45% (with the Plan).[18]

TABLE 3.14-13
PERCENTAGE OF EVENING WORK TRIPS COMPLETED WITHIN 45 MINUTES

	2008 Base Year	2035 No Project	2035 Plan
Auto			
Imperial	96%	96%	98%
Los Angeles	75%	72%	75%
Orange	83%	79%	82%
Riverside	86%	80%	87%
San Bernardino	82%	79%	83%
Ventura	86%	83%	85%
Region	**79%**	**76%**	**80%**
Transit			
Imperial	48%	58%	36%
Los Angeles	42%	40%	44%
Orange	42%	40%	38%
Riverside	49%	54%	55%
San Bernardino	44%	53%	48%
Ventura	31%	29%	29%
Region	**42%**	**40%**	**44%**

SOURCE: SCAG, 2007 *Regional Travel Demand Model Results.* Los Angeles, CA.

When compared to the base year, the percent of work opportunities within 45 minutes travel time by auto in 2035 from 79% (2008) to 80% (with the Plan) in 2035 and from 42% (2008) to 45% with the 2035 Plan.

Mitigation Measures

The impact would be beneficial. No mitigation measures are required.

Impact 3.14-5: Implementation of the 2008 RTP would contribute to a lower system-wide fatality accident rate for all travel modes in 2035 compared to the existing condition.

The system-wide daily fatality rate would be 0.39 fatalities per million persons for all travel modes, including transit and rail. This fatality rate is close to the existing (2008) rate (**Table 3.14-14**). The impact would be neutral. The 2008 RTP includes Transportation System Management strategies that

[18] SCAG 2007 *Regional Travel Demand Model Results*. Los Angeles, CA..

improve safety through reducing the concentration of weaving and merging, and that clear existing incidents and accidents more quickly, among other measures.

The injury rate to people in the region as a result of vehicular and transit-related accidents for the 2035 Plan is lower than the existing rate by 1.7%. The No Project alternative is 3.6% greater than 2008.

TABLE 3.14-14
2008 AND 2035 REGIONAL TRANSPORTATION SYSTEM ACCIDENT RATES

(Daily per million persons)	2008	2035 No Project	2035 Plan
Fatalities	0.39	0.41	0.39
Injuries	16.8	17.4	16.5
System Metrics (2007) and SWITRS Collected in 2007 as part of California Strategic Highway Safety Plan			
SOURCE: SCAG. (2007). *Regional Travel Demand Model Results*. Los Angeles, CA.			

Mitigation Measures

The impact would be neutral. No mitigation measures are required. Implementation of the California Strategic Highway Safety Plan could reduce transportation related fatalities in the region indicated in the 2008 RTP.

Impact 3.14-6: Implementation of the 2008 RTP would contribute to a lower system-wide injury accident rate for all travel modes in 2035 compared to the existing condition.

The system-wide daily injury rate would be 16.5 injuries per million persons for all travel modes, a decrease of 0.3 daily injuries per million persons when compared to the existing rate of 16.8 (**Table 3.14-14**). The 2008 RTP 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.

Mitigation Measures

The impact would be neutral. No mitigation measures are required. Implementation of the California Strategic Highway Safety Plan could further reduce transportation related fatalities in the region and is referenced in the 2008 RTP.

Cumulative Impact 3.14-7: Implementation of the 2008 RTP would contribute to a cumulatively considerable amount of transportation impacts, such as VMT and all-vehicle VHT in delay, to counties outside of the SCAG region.

The 2035 transportation model includes the population, households, and employment projected for 2035, and therefore the largest demand on the transportation system expected during the lifetime of the 2008 RTP. In accounting for the effects of regional population growth, the model output provides a regional, long-term and cumulative level of analysis for the impacts of the 2008 RTP on transportation resources. Forecast urban development and growth that would be accommodated by the transportation investments in the 2008 RTP, together with the increased mobility provided by the 2008 RTP would contribute to the significant impacts described in Impacts 3.14-1, 3.14-2, and 3.14-3 above. The regional growth, and thus cumulative impacts, are captured in the VMT, VHT, and heavy-duty truck VHT 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 would increase. The transportation demand from growth, in combination with the accommodating projects in the 2008 RTP would contribute to a cumulatively considerable transportation impact in these other counties.

The projects and measures designed to minimize VHT and VMT that are included in the 2008 RTP, and MM-TR.1 through MM-TR.6 would minimize this effect. However the regional contribution would remain **significant**.

Comparison With the No Project

Comparison with the No Project is included in the discussion of each impact (**3.14-1** through **3.14-6** above). The transportation impacts of the 2008 RTP would be less than those of the No Project Alternative.

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3.15 Water Resources

This chapter describes the existing water resources in the SCAG region, identifies the potential impacts of the RTP on these resources, suggests mitigation measures for the impacts and evaluates the residual impacts.

Environmental Setting

This section describes water resources and quality in the SCAG region, including a review of the regulatory framework under which water resources and supply are managed. It also describes existing conditions and infrastructures, and regional supply and demand.

Physical Setting

Climate

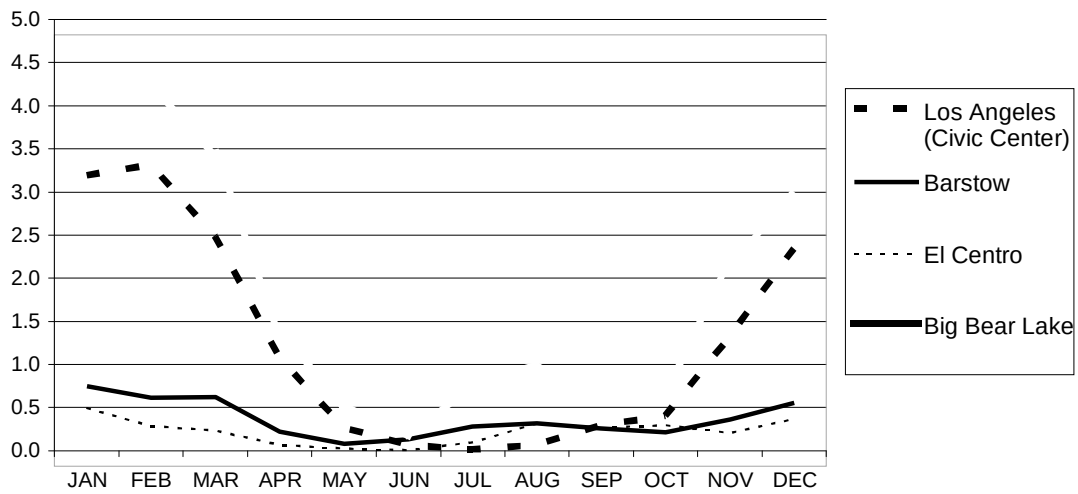
The climate of the SCAG region varies widely between the coastal and inland areas. Coastal areas are characterized by long, hot, dry summers, and short, mild, relatively wet winters, also known as Mediterranean climate, while inland areas experience more extreme temperatures and little precipitation. 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. As such, thunderstorms can produce flash flooding, which are more common than widespread flooding within the region. **Table 3.15-1** shows annual total precipitation from 1970 – 2005 throughout the SCAG region.

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, 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 Nino) and dry (La Nina) weather. **Figure 3.15-1** shows average monthly precipitation for selected areas in the SCAG region.

TABLE 3.5-1
AVERAGE TOTAL PRECIPITATION FOR SELECTED AREAS WITHIN THE SCAG REGION (1970-2005), IN INCHES

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Los Angeles (Civic Center)	3.29	4.02	2.93	2.67	0.31	0.08	0.01	0.11	0.28	0.49	1.16	2.17	17.52
Mountain Pass	0.93	1.15	1.05	0.44	0.28	0.21	0.99	1.09	0.57	0.50	0.65	0.74	8.60
El Centro	0.46	0.44	0.29	0.05	0.03	0.01	0.06	0.35	0.30	0.33	0.17	0.37	2.86
Redlands	2.71	2.85	2.43	0.84	0.39	0.11	0.09	0.20	0.36	0.64	1.47	1.47	13.57
Ventura	2.43	3.48	2.52	0.67	0.19	0.02	0.01	0.03	0.29	0.51	1.43	1.96	13.54
Laguna Beach	2.64	3.19	2.42	0.87	0.25	0.14	0.04	0.10	0.30	0.55	1.15	1.89	13.53
Eagle Mountain	0.54	0.64	0.45	0.07	0.07	0.05	0.26	0.83	0.41	0.23	0.18	0.42	4.15

FIGURE 3.15-1
AVERAGE MONTHLY PRECIPITATION FOR SELECTED AREAS WITHIN THE SCAG REGION (1960-2001



Source: Western Regional Climate Center, 2001. www.wrcc.com, accessed November 2007.

Hydrologic Regions

The Department of Water Resources (DWR) has divided the state into ten hydrologic regions (HR), 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 Santa Cruz 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.

Water Supply and Use in the Central Coast Hydrologic Region

The Coastal Branch California Aqueduct – part of the SWP – brings approximately 30,000 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.

Water Supply and Use in the South Lahontan Hydrologic Region

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 in 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 3.15-2**, five water agencies in the southwest portion of this region have contracts with the State Water Project (SWP) for a total of about 250,000 acre-feet of surface water annually. Four of these agencies are located within SCAG region. The East Branch of the SWP is used to recharge groundwater in the Mojave River Valley.

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1 25 TAF in 1998, 31 TAF in 2000, and 28 TAF in 2001. http://www.waterplan.water.ca.gov/docs/regions/map_stats_wbs_CC.pdf

2 DWR, California's Groundwater Update. 2003. Chapter 7, *Central Coast Hydrologic Region*. Page 140. http://www.dpla2.water.ca.gov/publications/groundwater/bulletin118/Bulletin118_3-CC.pdf

3 DWR. California Water Plan Update. Chapter 10,Volume 3, page. 10-1.2005.

TABLE 3.15-2
WATER AGENCIES IN THE SOUTH LAHONTAN HYDROLOGIC REGION

Water Agency	State Water Project Description
Mojave Water Agency (MWA)	MWA relies predominately from groundwater; it also receives water as one of the 29 SWP contractors, per their new Integrated Regional Water Management Plan update (IRWMP).
Antelope Valley-East Kern Water Agency (AVEK)	Largest SWP contractor; provides water to five major municipal agencies and 16 smaller water service agencies.
Palmdale Water District (PWD) & Little Rock Irrigation District (LRID)	Littlerock Reservoir has 2,700 acre-fee capacity and provides water to LRID. Water from Littlerock Reservoir is releases 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, California Water Plan 2005. Page 10-5.

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 valley, 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 County, Orange County, Los Angeles, San Bernardino, and Riverside County. Several prominent rivers exist 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 cities, water districts, and a county authority that serves 18 million people living in six counties stretching from Ventura to San Diego. MWD imported an average of 703,000 acre-feet per year of water from the SWP from 1972 to 2003, and 680,000 acre-feet or more of water from the CRA.

Colorado River Hydrologic Region

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

[4] DWR. California Water Plan Update. Chapter 5, Volume 3, page. 5-1.2005.

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 in 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, 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 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 3.15-1**), 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). Bellow is a summary 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. 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). 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 to include 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, Los Angeles, and East Los Angeles.

San Gabriel River Watershed (HUC 18070106). 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 64 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 watersheds 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, 4 percent agriculture, and 49 percent open space. Major cities include Santa Ana, Tustin, Irvine, Costa Mesa, and Newport Beach.

Seal Beach - Westminster Watershed (HUC 1807020). 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 Harbour complex, and the East Garden Grove-Wintersburg Channel drains through Bolsa Bay into Huntington Harbour. Seal Beach – Westminster Watershed falls in the South Coast Hydrologic Region.

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). 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, including also 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 of elevation at 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.

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/west by the Mojave and San Gabriel watersheds. The highest elevation in the watershed occurs 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 Watershed is in Riverside County, and is centered roughly on the city of Hemet. It includes Lake Elsinore, as well as Sun City.

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 it 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 uses 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, venture, 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 flow like water down steep slopes and into the valley 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.

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.

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. The Lake Arrowhead Dam was completed in 1922, 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 therefore 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 city 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 3.15-3**, as well as shown on **Map 3.15-2** in the Map Chapter at the end of this document.

Groundwater Hydrology[5]

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 truly 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 between 23 and 29 percent of total water use, depending on precipitation levels.[6] 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.[7] 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 to as groundwater

5 Burr Consulting. Regional Infrastructure Evaluation. Unpublished document prepared for SCAG, February, 2007.

6 Department of Water Resources, *California 's Groundwater - Bulletin 118*. Update 2003. Located at http://www.groundwater.water.ca.gov/bulletin118/update2003/index.cfm

7 Critical overdraft is defined by the DWR as *"…when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts."* Department of Water Resources, *2005 Water Plan Update*, Vol. 1, Ch. 3.

TABLE 3.15-3
MAJOR SURFACE WATERS

Los Angeles Basin (4)

Wetlands	Rivers, Creeks, and Streams	Lakes and Reservoirs
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 (6)

Wetlands	Rivers, Creeks, and Streams	Lakes and Reservoirs
	Mojave River	Silver Lake
	Amargosa River	Silverwood Lake
		Mojave River Reservoir
		Lake Arrowhead
		Soda Lake

Colorado River Basin (7)

Wetlands	Rivers, Creeks, and Streams	Lakes and Reservoirs
	Colorado River	Lake Havasu
	Whitewater River	Gene Wash Reservoir
	Alamo River	Copper Basin Reservoir
	New River	Salton Sea
		Lake Cahulla

Santa Ana Basin (8)

Wetlands	Rivers, Creeks, and Streams	Lakes and Reservoirs
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 (9)

Wetlands	Rivers, Creeks, and Streams	Lakes and Reservoirs
	Santa Margarita River	Vail Lake
	Aliso Creek	Skinner Reservoir

SOURCE: Regional Water Quality Control Boards, as amended as of 2003. Water Quality Control Basin Plans for Regions 4,6, 7,8,9.

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.[8] 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.

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. The evaluation is being conducted by the U.S. Geological Survey, U.S. Department of the Interior and SWRCB. Groundwater wells throughout the SCAG region are being studied for contaminants; the evaluation is scheduled for completion in 2010. The only portion of the SCAG region completed to date is the Temecula Valley area in southwestern Riverside County. In the Temecula area, the study found perchlorate, pesticides, and other contaminants in water wells, but none exceeding 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 are being installed beneath the cities of La Puente and Industry in 2006. Groundwater continues to be used as the predominant source of water supply in the valley. Similar problems exist in the Bunker Hills subbasin of the Upper Santa Ana Valley groundwater basin. Perchlorate contamination is emerging as an important contaminant, and has been found in wells in the Rialto, Colton and Fontana areas of San Bernardino County.

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

8 California Department of Water Resources, *Draft Bulletin 118*. Updated 2003.

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 Supply and Demand

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 82 and 83 million acre feet (maf).[9] Of this total, the SCAG region accounted for approximately 9.8 maf.[10]

The increase in California's water demand is due primarily to the increase in population. According the California Water Plan Update 2005, under a baseline scenario following current trends in use and growth, water demand in California will increase by approximately 3.5 maf by 2030.[11] 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, and water conservation practices. MWD estimates that average residential per capita use ranges from 97 gallons per person per day in coastal areas, to 162 gallons per person per day in desert areas.[12] **Table 3.15-4** provides factors that influence water demand.

TABLE 3.15-4
FACTORS INFLUENCING PER CAPITA WATER USE

Factors that increase per capita water use	Factors that decrease per capita water use
increased household income	increased household size
increased labor force	increased proportion of multi-family housing
increased commercial development	changes in the industrial mix
growth in the inland region	urban water conservation

SOURCE: SCAG. (1996). *Regional Comprehensive Plan and Guide*. Los Angeles, CA.

9 Department of Water Resources, *2005 Water Plan Update*, Vol. 1, Ch. 3.
10 Ibid.
11 Department of Water Resources, *2005 Water Plan Update*, Vol. 1, Ch. 4.
12 Southern California Association of Governments. (1996). *Regional comprehensive plan and guide*. Los Angeles, CA.

Water Conservation

The results of conservation in Los Angeles have been remarkable; the Los Angeles Department of Water and Power (DWP) reported in their *2005 Urban Water Management Plan* that "water conservation continues to play an important part in keeping the city's water use equivalent to levels seen 20 years ago." [13] During this same period, DWP's service area grew in population by more than 750,000 people.[14]

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.[15]

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 transf 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 area.

Local Water Supply

Local sources of water account for approximately 25 percent of the total volume consumed annually in the SCAG region.[16] Local sources include surface water runoff, groundwater, and water reclamation. Water balance summaries for each of the hydrologic regions in the SCAG region are provided in **Table WATER-1** in the Technical Appendix.

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13 Los Angeles Department of Water and Power. See http://www.ladwp.com/ladwp/cms/ladwp001354.jsp.
14 Castaic Lake Water Agency estimates that conservation will reduce their total future demand by 10 percent. See Castaic Lake Water Agency, *2005 Urban Water Management Plan*, p. 2-1. See http://www.clwa.org/about/pdfs/2005UWMPCh2WaterUse.pdf.
15 Metropolitan Water District. (2003). *Report on Metropolitan's water supplies*. Los Angeles, CA.
16 Department of Water Resources, *2005 Water Plan Update.* Vol. 1.

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 55,000 acre-feet per year (afy) within the Metropolitan Water District service area (not including San Diego County).[17] Within the desert regions, the amount is considerably less, owing to climatic differences.

Local Groundwater

Groundwater represents most of the SCAG region's fresh water supply, making up between 23 and 29 percent of total water use, depending on precipitation levels.[18] In California, ground water typically provides 30 percent of the urban and agricultural water used. This proportion increases to 40 percent in dry years.[19] The hydrologic regions vary in their dependence on groundwater for urban and agricultural uses. These differences are reflected in **Table 3.15-5**. **Map 3.15-3** 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.[20] Changes in groundwater storage for the hydrologic regions included in the SCAG region are shown in **Table WATER-1** in the Technical Appendices.

TABLE 3-15-5
GROUNDWATER DEPENDENCE IN THE SCAG REGION

Hydrologic Region	Percentage of the Total Urban and Agricultural Water Supply Provided by Groundwater
Central Coast[1]	83%
South Coast[2]	23%
South Lahonton[3]	50%
Colorado River[4]	8%

[1] Includes part of Ventura County. The remainder is outside of the SCAG Region.
[2] Includes Orange County, most of San Diego and Los Angeles counties, parts of Riverside, San Bernardino, Ventura, Kern and Santa Barbara counties.
[3] Includes most of San Bernardino County, as well as Inyo, and parts of Mono, Kern and Los Angeles counties.
[4] Includes all of Imperial County, most of Riverside, and parts of San Bernardino and San Diego counties.

Recent efforts to store recycled water and surplus water in groundwater basins for use during drought periods have proven successful. MWD has entered into 19 agreements with various water agencies for groundwater storage, resulting in approximately 87,000 af of added supply per

17 Metropolitan Water District. (2003). Appendix A: Metropolitan water demands. In *Report on Metropolitan water supplies*. Los Angeles, CA..

18 Department of Water Resources, *California 's Groundwater - Bulletin 118*. Update 2003. Located at http://www.groundwater.water.ca.gov/bulletin118/update2003/index.cfm

19 California Department of Water Resources. (2003). DRAFT bulletin 118: Draft California groundwater update. Sacramento, CA.

20 California Department of Water Resources. (2003). *DRAFT California Water Plan Update*. Sacramento, CA.

year.[21] 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 Count 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, account for approximately 355,000 af annually. The agency estimates that by 2025, this amount could be as high as 480,000 af, with an additional 130,000 af by 2050.[22]

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 recently completed filling Diamond Valley Lake near Hemet in Riverside County. This reservoir provides approximately 800,000 acre-feet of additional 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.

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21 Metropolitan Water District. (2003). Appendix A: Metropolitan water demands. In *Report on Metropolitan water supplies*. Los Angeles, CA.

22 Metropolitan Water District of Southern California, *The Regional Urban Water Management Plan*, p. III-24. November 2005.

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 more than 6 maf of water to the SCAG region annually, accounting for nearly three quarters of the total water used in the region.[23]

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 the Metropolitan Water District of Southern California (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 3.15-4** through **3.15-6** in the Map Chapter at the end of this document 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 recent 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.[24]

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

[23] Department of Water Resources, *2005 Water Plan Update.* Vol. 1.
[24] Metropolitan Water District. (2003). Report on Metropolitan's water supplies. Los Angeles, CA.

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 360,000 af to 1.3 maf annually.[25] Southern California's maximum SWP yield is about 2.0 maf per year. SWP provides water to approximately 23 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 almost 500,000 af per year in normal years, and as little as 150,000 af per year in drier years.[26] Recent deliveries have been cut almost in half due to dwindling Sierra snow pack 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.[27] 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

[25] Metropolitan Water District. (2003). Appendix C: California aqueduct deliveries. In Report on Metropolitan's Water Supplies. Los Angeles, CA.
[26] Ibid.
[27] Some urban agencies also have the ability to enter "spot" water markets and to purchase water on an "as needed" basis.

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.[28] 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 3.15-6**.[29]

TABLE 3.15-6
MAJOR WATER SUPPLIERS IN THE SCAG REGION

Water Agency	Land Area (square miles)	Sources of Water Supply
Antelope Valley and East Kern District	2,350	SWP, groundwater, reclaimed water
Bard Irrigation District (including the Yuma Project Reservation Division)	23	Colorado River
Casitas Municipal Water District	150	Groundwater
Castaic Lake Water Agency	125	SWP
Coachella Valley Water District	974	SWP, Colorado River, local
Crestline Lake Arrowhead	53	SWP
Desert Water Agency	324	SWP[1], 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	188	Colorado River
San Bernardino Municipal Water	328	SWP, groundwater
San Gorgonio Pass Water Agency	214	Groundwater

SOURCE: Environmental Science Associates, Los Angeles, California. 2000.

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

[28] Metropolitan's service area includes San Diego County.
[29] This table excludes retail agencies supplied by a regional wholesaler.

Los Angeles River maintain a perennial flow due to agricultural irrigation and urban landscape watering.

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.

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.

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.

> "A recent study in the City of Irvine showed that the use of automated irrigation controllers reduced dry season runoff by 50 percent. Notably, the decrease in runoff did not appear to increase the concentration of pollutants in the runoff. It therefore appears that a reduction in non-point source pollution can be achieved by increasing irrigation efficiency. See http://www.irwd.com/Conservation/water_conservation_research.php)"

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.[30]

- *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.

30 The following sections are excerpted from Metropolitan Water District of Southern California, *The Regional Urban Water Management Plan*, Chapter IV. November 2005.

- *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 undesirable aesthetic impacts.

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.[31]

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

[31] Perchlorate interferes with the thyroid gland's ability to produce hormones required for normal growth and development.

overriding consideration in decisions about whether to recover perchlorate-contaminated groundwater is the cost-effectiveness of available technologies.

Total Organic Carbon and Bromide

When source water containing high levels of total organic carbon (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

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.

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. 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 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 effected areas include San Bernardino (61 sources), Los Angeles (50 sources), Riverside (24 sources) and Orange (4 sources).

Currently it appears likely that current treatment standards will increase cost but not necessarily decrease local water supplies. However, if treatments 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 to the air. Currently, the U.S 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.

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.

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 pollutants. Pollutants in urban runoff include urban debris, suspended solids, bacteria, viruses, heavy metals, pesticides, petroleum hydrocarbons, and other organic compounds. In addition to these impairments, excessive groundwater pumping allows saltwater intrusion from the ocean to further degrade groundwater quality. Also of note, the impacts on groundwater caused by the natural infiltration of surface waters decrease with a growth in urban development and the creation of impervious surfaces.

Coastal Waters

Coastal waters in the region include bays, harbors, estuaries, beaches, and open ocean. Deep draft 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 3.15-7**).

Wastewater

Wastewater flows and capacities of major treatment facilities are shown in **table 3.15-7**. 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.

Regulatory Setting

Federal Agencies and Regulations

The U.S. Environmental Protection Agency (EPA)

The EPA is the federal agency responsible for water quality management and administration of the CWA. The EPA has delegated most of the administration of the CWA in California to the SWRCB. Much of the responsibility for implementation of the SWRCB's policies is delegated to the nine Regional Water Quality Control Boards (RWQCB), as described below. EPA conducts groundwater protection and contaminated site remediation programs, such as installation of groundwater cleanup systems in the San Gabriel Valley.

Clean Water Act

The Clean Water Act (CWA) (33 U.S.C Section 1251 et seq), formerly the Federal Water Pollution Control Act of 1972, was enacted it 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 RWQCBs.

TABLE 3.15-7
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	3.9	8.0
City of Brawley	3.6	5.9
City of Calexico	2.7	4.2
Los Angeles County		
Los Angeles County Sanitation Districts –		
– Joint Outfall System	316.0	385.0
– Lancaster Water Reclamation Plant	12.8	16.0
– Palmdale Water Reclamation Plant	9.8	15.0
– Santa Clarita Water Reclamation Plant	20.5	28.1
City of Los Angeles	550.0	560.0
Las Virgenes Municipal Water District	9.5	16.0
City of Burbank	9.0	9.0
Orange County		
Orange County Sanitation District	229.0	366.0
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	31.3	49.0
City of Riverside	32.0	40.0
Coachella Valley Water District	18.0	31.0
San Bernardino County		
Inland Empire Utilities Agency	59.0	68.0
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	31.7	39.7
City of Simi Valley	12.5	18.0
City of Thousand Oaks	11.0	12.0
City of Ventura	9.0	12.0
Camarillo Sanitation District	4.0	7.3

SOURCE: SCAG 2007

Safe Drinking Water Act

The Safe Drinking Water Act (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.

EPA 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. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.[32]

The U.S. Army Corps of Engineers (USACE)

Section 404 of the CWA obligates the USACE 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 Agency (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 3.15.8** 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.

[32] Burr Consulting, 2006.

- Zone C – Areas of minimal flooding not requiring flood insurance.

The U.S. Bureau of Reclamation (USBR)

The USBR operates the Colorado River project, an extensive network of dams, canals and related facilities. USBR serves as Watermaster overseeing contentious water rights issues, and runs drought protection programs.

State Agencies and Regulations

The California State Water Resources Control Board (SWRCB)

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.

Section 303(d) of the CWA requires the SWCB to list impaired water bodies in the Sate 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.

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, and 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[33] (DPH)

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.[34]

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 in some cases water sources.

The California Department of Fish and Game (DFG)

DFG has jurisdiction over conservation and protection of fish, wildlife, plants and habitat. DFG 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

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33 As of July 1, 2007, Senate Bill 162, Chapter 241, Statutes of 2006, also known as the California Public Health Act of 2006, is in effect. This bill separates the Department of Health Services into two agencies: the Department of Public Health (DPH) and the Department of Health Care Services (DHCS).

34 Burr Consulting, 2006.

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.

Methodology

The PEIR identifies the potential impacts of the proposed Plan on water resources. The water quality analysis evaluates the regional-scale impact of the RTP and the cumulative impact of the RTP 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. In addition, the PEIR identifies transportation projects that are located in targeted watersheds, adjacent to impaired water bodies, or in flood hazard areas and considers the potential environmental effects of associated housing and employment growth. 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 2008 RTP 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).

Determination of Significance

Direct impacts to water quality were evaluated using Geographic Information Systems (GIS) to overlay projects in the RTP upon water resources. The proposed projects of the 2008 RTP and associated growth were plotted on maps of the SCAG region's 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.

Long-term, regional-scale, cumulative impacts of the RTP 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.

Comparison with the No Project

The analysis of water resources includes a comparison of the expected future conditions with the 2008 RTP to 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 expected effects of the 2008 RTP.

Significance Criteria

A potentially significant adverse impact on water resources would occur if the proposed Plan would:

- Substantially degrade water quality compared to the existing conditions;
- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge;
- Substantially alter the existing drainage patterns, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems;
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows;
- 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;
- Substantially alter the existing drainage patterns, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation;
- Generate a substantial amount of wastewater that exceeds the region's available infrastructure's capacity to handle and dispose of the wastewater;
- Generate a substantial increase in the amount of potable water demand that exceeds the region's existing available supply and/or infrastructure capacity to provide water service; or
- Result in the need to construct new water supply infrastructure.

Impacts and Mitigation Measures

Project-specific studies will be necessary to determine the actual potential for significant impacts on water resources resulting from implementation of the Plan. However, 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 2008 RTP. Indirect impacts due to the changes in population distribution expected to occur due to the 2008 RTP's transportation investments, and transportation and land use policies are also discussed.

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.

Impact 3.15-1: Local surface water quality could be degraded by increased roadway runoff created by RTP projects, potentially violating water quality standards associated with wastewater and stormwater permits. RTP projects 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 Plan projects may increase pollutant loads carried by storm water runoff. For example, road cut erosion can increase long-term siltation in local receiving waters. Recent 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.[35] 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 3.15-8** lists the pollutants commonly associated with transportation.

Map 3.15-7 shows the impaired water bodies identified within the SCAG region. The SWRCB has developed a TMDL for trash in Ballona Creek, and is proposing a trash TMDL for the LA River. It has also begun the process of assigning TMDLs for metals in both of those bodies. The TMDLs will provide a numerical threshold for each pollutant within each watershed to be used for regulating both point and non-point source discharges. 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 proposed highway, arterial and other improvement projects proposed in the 2008 RTP would increase impervious surfaces in the SCAG region. **Table 3.15-9** provides the lane mile additions planned for each county. Assuming an average lane width of 12 feet, approximately 105,000 additional acres of impervious surface could be added. Some of the lane additions may be constructed using re-striping and existing right of way, reducing the contribution to increased impervious surfaces. The High Speed Rapid Transit (HSRT) projects would add

[35] Center for Watershed Protection. (1988). *Rapid watershed planning handbook – A resource guide for urban subwatershed management.* Ellicott City, MD.

approximately 269 route miles, along with associated stations and other maintenance structures. Rail lines and their associated structures, as well as proposed goods movement enhancement projects, would be expected to increase the amount of impervious surfaces as well, although many of the proposed alignments are within existing rights-of-way. Additional impervious surfaces would increase the potential for highway and other runoff 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. Under new permit regulations, TMDL requirements are now included in all MS4 permits, further strengthening a permit's controls of runoff.

TABLE 3.15-8
POLLUTANTS ASSOCIATED WITH TRANSPORTATION

Pollutant	Source
Asbestos	Clutch plates, brake linings
Cadmium	Tire wear and insecticides
Copper	Thrust-bearing, bushing, rbake 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 materials, 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 Particulates	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.

Most of the proposed 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 3.15-10** lists many of the impaired water bodies located within 150 feet of freeway, transit and freight rail projects proposed in the 2008 RTP. 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.

TABLE 3.15-9
NEW REGIONAL LANE MILES BY COUNTY*

County	Imperial	Los Angeles	Orange	Riverside	San Bernardino	Ventura	SCAG total
Freeway Lane Miles	412	4,749	1,422	1,949	2,710	555	**11,798**
Principal Arterial Lane Miles	543	9,118	3,202	1,666	2,966	908	**18,402**
Minor Arterial Lane Miles	648	9,340	3,168	4,000	4,678	1,040	**22,874**
Major Collector Lane Miles	2,353	3,355	439	4,256	5,907	623	**16,934**
HOV Lane Miles	0	570	243	132	206	7	**1,159**
Toll Lane Miles	0	144	541	13	0	0	**698**
Total Lane Miles in each County	3,956	27,276	9,016	12,016	16,467	3,134	**71,866**
Average Potential Additional Impervious Acreage**	5,765	39,749	13,139	17,511	23,998	4,567	**104,729**

SOURCE: SCAG. (2007). Regional Travel Demand Model. Los Angeles, CA.
*This analysis does not include transit projects or HSRT projects.
**Assumes an average lane width of 12 feet

TABLE 3.15-10
IMPAIRED WATER BODIES (303(D)) OCCURRING WITHIN 150 FEET OF A FREEWAY, TRANSIT, OR FREIGHT RAIL PROJECT IN THE 2008 RTP

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 & 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 (was 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, was part of Conejo Creek Reach 3 on 1998 303d list)	Ammonia, ChemA (tissue), Chlordane, DDT, Dieldrin, Endosulfan (tissue), Fecal Coliform, PCBs, Sedimentation/Siltation, Sulfates, Total Dissolved Solids, Toxaphene (tissue & sediment), Toxicity
Calleguas Creek Reach 12 (was Conejo Creek/Arroyo Conejo North Fork on 1998 303d list)	Ammonia, Chlordane (tissue), DDT (tissue), Dieldrin, PCBs, Sulfates, Total Dissolved Solids, Toxaphene

TABLE 3.15-10 (Continued)
IMPAIRED WATER BODIES (303(D)) OCCURRING WITHIN 150 FEET OF A FREEWAY, TRANSIT, OR FREIGHT RAIL PROJECT IN THE 2008 RTP

Impaired Water Body	Pollutants
Calleguas Creek Reach 13 (Conejo Creek South Fork, was Conejo Cr Reach 4 and part of Reach 3 on 1998 303d list)	Ammonia, ChemA (tissue), Chlordane, Chloride, DDT, Dieldrin, Endosulfan (tissue), Fecal Coliform, PCBs, Sulfates, Total Dissolved Solids, Toxaphene (tissue & 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, Toxaphene
Laguna Canyon Channel	Sediment Toxicity
Los Angeles River Reach 1 (Estuary to Carson Street)	Ammonia, Cadmium, Coliform Bacteria, Copper, Dissolved, Cyanide, Diazinon, Lead, Nutrients (Algae), pH, Trash, Zinc, Dissolved
Los Angeles River Reach 2 (Carson to Figueroa Street)	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, Trichloroethylene/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 Res)	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 & sediment), Lead (tissue), PCBs, Phenanthrene, Pyrene, Zinc (sediment)

Source: SCAG analysis of California State Water Resources Control Board 2006 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

Construction activities can be a major source of sediment loading and hydrocarbon contamination in local waterways. Unprotected soil easily erodes with rain water. 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 2008 RTP is expected to adopt BMPs appropriate to local conditions and to the proposed construction techniques that will reduce pollution runoff.

The proposed Plan's new roadway projects would create new impervious areas. Without mitigation, 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). This would be a **significant** impact.

Mitigation Measures

The following mitigation measures are recommended:

MM-W.1: Transportation improvements shall comply with federal, state, and local regulations regarding storm water management. State-owned highways and other transportation facilities are subject to compliance with a statewide stormwater permit issued to Caltrans.

MM-W.2: Project implementation agencies shall 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-W.3: Structural storm water runoff treatment shall 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-W.4: Implementation agencies shall 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-W.5: Implementation agencies shall 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 shall 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-W.6: Implementation agencies shall 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 shall comply with the Caltrans storm water discharge permit. Best Management Practices shall be identified and implemented to manage site erosion, wash water runoff, and spill control.

MM-W.7: Projects requiring the discharge of dredged or fill materials into U.S. waters, including wetlands, shall 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-W.8: In compliance with applicable municipal separate storm sewer system discharge permits as well as Caltrans' storm water discharge permit, long-term sediment control shall be effected through erosion control and revegetation programs designed to allow reestablishment of native vegetation on slopes and undeveloped areas.

MM-W.9: Drainage of roadway runoff shall comply with Caltrans' storm water discharge permit. Wherever possible, roadways shall be designed to convey storm water through vegetated median strips that provide detention capacity and allow for infiltration before reaching culverts.

The infiltration capacity of storm water runoff detention facilities shall be sized to minimize, to the greatest extent possible, the effect of increased impervious surfaces.

Significance after Mitigation

The mitigation measures would not fully mitigate water quality degradation, violation of water quality standards, or prevent erosion or siltation. The impact remains **significant**.

Impact 3.15-2: Increased impervious surfaces due to transportation projects would reduce groundwater infiltration.

The proposed 2008 RTP would include additional impervious surfaces installed through new roadway projects. **Table 3.15-9** provides information on the lane mile additions expected in each county. With the implementation of the 2008 RTP, approximately 72,000 new lane miles would be added to the region. These additions would include new facilities, additional right-of-way on existing facilities and/or re-striping of existing facilities. The specifics of each project are unknown at this time. Conservatively, each lane addition was assumed to have an average width of 12 feet. The area of additional impervious surface has been calculated and appears in **Table 3.15-9**. 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 the hard surface of a roadway 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.[36]

The increase in impervious surfaces due to 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.

Mitigation Measures

MM-W.10: Project implementation agencies shall avoid designs that require continual dewatering where feasible.

MM-W.11: Project implementation agencies shall ensure that projects that do require 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 shall comply with appropriate building codes and standard practices including the Uniform Building Code.

MM-W.12: Treatment and control features such as detention basins, infiltration strips, and other features to control surface runoff and facilitate groundwater recharge shall 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-W.13: Where feasible, transportation facilities shall not be sited in groundwater recharge areas, to prevent conversion of those areas to impervious surface.

Significance After Mitigation

Implementation of these mitigation measures would reduce the regional impact but impacts would remain **significant** due to the large areas of additional impermeable surfaces.

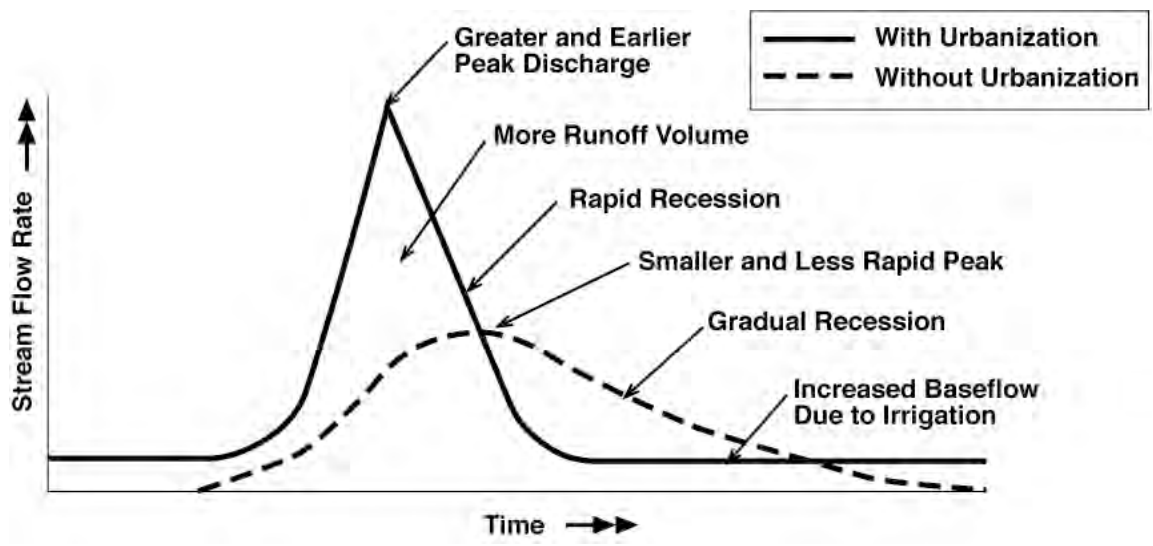
Impact 3.15-3: The 2008 RTP could increase flooding hazards, by placing transportation investments, on alluvial fans and within 100-year flood hazard areas.

[36] Scheuler, T.R. (1994). The importance of imperviousness. *Watershed Protection Techniques 1(3)*: 100-111. Retrieved August 28, 2003, from http://www.stormwatercenter.net/Practice/1-Importance%20of%20Imperviousness.pdf

The proposed 2008 RTP 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 3.15-2** depicts a typical hydrograph showing the effects of urbanization on peak flow rates.

FIGURE 3.15-2
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.

The 2008 RTP transportation projects would result in increased impervious surfaces. 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.

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 highways are placed within these areas of

an existing flood plain the public is exposed to the hazards of flash flooding. **Map 3.15-9** shows the location of the major floodplains 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 2008 RTP mostly include widening existing highways, constructing new interchanges, new highway segments, new rail lines and the HSRT projects. **Table 3.15-9** summarizes additional lane miles proposed for each county and provides a conservative calculation (as some lane additions may be accomplished through lane re-striping) of increased impervious surfaces proposed by the projects based on lane miles only. 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 3.15-9.**

Placing new structures within an existing floodplain can impede flood waters, altering the flood risks both upstream and downstream. Road improvements in the Plan are located within 150 feet of approximately 4,500 acres of identified 100-year flood zones and 7,200 acres of identified 500-year flood zones. The flooding risks associated with projects located in these flood zones can be modified with appropriate design and alignment considerations.

Mitigation Measures

The following mitigation measures are recommended:

MM-W.14: Natural riparian conditions near projects shall be maintained, wherever feasible, to minimize the effects of stormwater flows at stream crossings. Where feasible, riparian areas should be restored or expanded to mitigate additional impervious surface and associated runoff.

MM-W.15: Implementing agencies shall assure projects mitigate for changes to the volume of runoff, where any downstream receiving waterbody 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 be 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-W.16: Impacts shall 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, as required in MM-W.15.

MM-W.17: All roadbeds for new highway and rail facilities should 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 shall be evaluated

and projects shall be sited to avoid alluvial fan flooding where feasible. Delineation of floodplains and alluvial fan boundaries should attempt to account for future hydrologic changes caused by global climate change.

MM-W.18: Transportation improvements shall comply with local, state, and federal floodplain regulations. Projects requiring federal approval or funding shall 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-W.19: Improvement projects on existing facilities shall 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 shall be completed to eliminate increases in peak flow rates from current levels.

Significance after Mitigation

After implementation of the mitigation measures, the 2008 RTP projects would regionally have a **less than significant impact.**

Cumulative Impact 3.15-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in impacts to water quality.

The growth projection associated with the 2008 RTP would substantially increase the amount of urbanized land in the SCAG region. With the 2008 RTP, the amount of new urbanized acreage (consuming previously vacant land) would be approximately 200,000 acres.[37] 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.[38]

Mitigation Measures

Mitigation Measures W.1 through W.9 shall be applied to all urban development projects, as feasible, in addition to the following measures:

[37] SCAG 2007
[38] Keller, Arturo A. and Yi Zheng. (2003). Personal communication. University of California. Santa Barbara, CA.

MM-W.20: Local governments should encourage Low Impact Development and natural spaces that reduce, treat, infiltrate and manage stormwater runoff flows in all new developments.

MM-W.21: Local governments should implement green infrastructure and water-related green building practices through incentives and ordinances. Green building resources include the U.S. Green Building Council's Leadership in Energy and Environmental Design, Green Point Rated Homes, and the California Green Builder Program.

MM-W.22: Local governments should integrate water resources planning with existing greening and revitalization initiatives, such as street greening, tree planting, development and restoration of public parks, and parking lot conversions, to maximize benefits and share costs.

MM-W.23: Developers, local governments, and water agencies should maximize permeable surface area in existing urbanized areas to protect water quality, reduce flooding, allow for groundwater recharge, and preserve wildlife habitat. New impervious surfaces should be minimized to the greatest extent possible, including the use of in-lieu fees and off-site mitigation.

MM-W.24: SCAG shall continue to work with local jurisdictions and water quality agencies, through its Water Policy Task Force and other means, to encourage regional-scale planning for improved water quality management and pollution prevention. Future impacts to water quality shall be avoided through cooperative planning, information sharing, and comprehensive pollution control measure development within the SCAG region. This cooperative planning shall occur during as part of SCAG's ongoing regional planning efforts.

Significance After Mitigation

The urban development expected by 2035 would create adverse water quality and waste discharge conditions and/or unfavorably alter existing drainage patterns in a manner that would result in substantial erosion or siltation. The 2008 RTP's influence on growth distribution is a cumulatively considerable contribution to this **significant impact**.

Cumulative Impact 3.15-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in impacts to stormwater infiltration and groundwater recharge.

The addition of approximately 5.14 million people to the SCAG region would require increased urban development for housing, employment centers, and other services. The amount of new

urbanized acreage (consuming previously vacant land) would be on the order of 200,000 acres.[39] The enlarged impervious surfaces associated with this urban development would potentially reduce groundwater recharge.

Mitigation Measures

Mitigation Measures W.10 through W.13 shall be applied to all urban development projects, as feasible, in addition to the following measure:

MM-W.25: SCAG shall continue to work with local jurisdictions and water agencies, to encourage regional-scale planning for improved stormwater management and groundwater recharge. Future adverse impacts shall be avoided through cooperative planning, information sharing, and comprehensive implementation efforts within the SCAG region. Meetings of SCAG's Water Policy Task Force and Regional Council offer an opportunity for local jurisdictions and water agencies to share information and strategies for improving regional performance in these efforts.

Significance after Mitigation

The urban development expected by 2035 would potentially affect stormwater infiltration and groundwater recharge. Future planning and implementation efforts may reduce the significance of this impact. However, given current conditions, the 2008 RTP's cumulative effects on stormwater infiltration and groundwater recharge would contribute to a **significant impact** on regional water resources.

Cumulative Impact 3.15-6: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in flooding hazard impacts.

The amount of new urbanized acreage (consuming previously vacant land) would be on the order of 200,000 acres.[40] 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.

Mitigation Measures

Mitigation Measures W.14 through W.19 shall be applied to all urban development projects, as feasible, in addition to the following measure:

[39] Fregonese, Calthorpe, and Associates. (2007). Unpublished data. Los Angeles, CA.
[40] SCAG 2007.

MM-W.26: Local governments should prevent development in flood hazard areas that do not have appropriate protections, especially in alluvial fan areas of the region.

Significance after Mitigation

Urban development expected by 2035 would potentially result in additional structures in areas with flood hazards. Future planning efforts may reduce the significance of this impact; however, to assume that all flood hazards would be avoided would be speculative. The 2008 RTP's effect on population distribution and its associated contribution to the impact of flooding hazards is **significant**.

Cumulative Impact 3.15-7: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the need for increased wastewater treatment capacity in the region by 2035. The proposed Plan influences population growth, resulting in an indirect and cumulative impact on wastewater treatment services.

The average wastewater generation rate in each county[41] was applied to the expected population growth in each county and compared to the remaining wastewater treatment capacity derived from the data in **Table 3.15-7**. Broadly assuming that wastewater capacity can be shared among the agencies in each county, it is estimated that Imperial, Riverside, and San Bernardino counties would outgrow their wastewater treatment capacity by the year 2035.

To determine the significance of the impact, wastewater treatment capacities needed in 2035 must be compared to the existing capacities only. (This analysis does not consider existing plans to build new facilities.)

Mitigation Measures

MM-W.27: Local jurisdictions 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-W.28: 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-W.29: Local jurisdictions 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

41 SCAG. (1994). *Regional Transportation Plan and Chapters of the Regional Comprehensive Plan Final Environmental Impact Report.* Los Angeles, CA.

generate high volumes of wastewater until wastewater agencies have expanded capacity.

Significance after Mitigation

The mitigation measures would lessen the impacts on wastewater treatment capacity in the region; however, they are not expected to prevent an imbalance between the demand for regional capacity and existing regional capacity. The 2008 RTP would make a cumulatively considerable contribution to this **significant impact.**

Cumulative Impact 3.15-8: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to an increased demand for water supply and its associated infrastructure. Water agencies in the SCAG region produce many long-range planning studies to provide a system adequate to supply water demand, however the *existing* water supplies and infrastructure would not be sufficient to meet the expected 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 demand at 2035. As population increases in the SCAG region, the demand for municipal water will increase. Increased commercial and industrial land uses will also increase water demand. As water demand increases, water supply may potentially decrease. Reduction in supply – combined with 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 by 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, 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. Metropolitan Water District (MWD) is currently planning an update to its water supply projections in response to these challenges. 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 the effect to less than significant levels. 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, areas currently projecting future deficits, and since local replacement measures are not yet in place, the impact remains significant.

Mitigation Measures

MM-W.30: Project developers and agencies should consider 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.

MM-W.31: Local water agencies 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-W.32: Developers, local governments, and water agencies should include conjunctive use as a water management strategy when feasible.

MM-W.33: SCAG shall encourage the kind of regional coordination throughout California and the Colorado River Basin that develops and supports sustainable policies in accommodating growth.

MM-W.34: SCAG 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-W.35: Developers and local governments 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.

MM-W.36: 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. SCAG's Water Policy Task Force presents an opportunity for local jurisdictions and water agencies to share information and strategies (such as those listed above) about their on-going water supply planning efforts, including the following types of actions:[42]

[42] Bullets one through four are existing SCAG policies.

Minimize impacts to water supply by developing incentives, education and policies to further encourage water conservation and thereby reduce demand. Involve the region's water supply agencies in planning efforts in order to make water resource information, such as water supply and water quality, location of recharge areas and groundwater, and other useful information available to local jurisdictions for use in their land use planning and decisions.

Provide, as appropriate, legislative support and advocacy of regional water conservation, supply and water quality projects.

Promote water-efficient land use development.

The Water Policy Task Force and other ongoing regional planning efforts present an opportunity for SCAG to partner with the region's water agencies in outreaching to local governments, special water districts, and the California Department of Water Resources on important water supply issues. SCAG provides a unique opportunity to increase two-way communication between land use and water planners. The goals of the Task Force would not be to duplicate existing efforts of the water agencies.

Significance after Mitigation

Full implementation of these water supply mitigation measures may provide an adequate and reliable future water supply and infrastructure. The various water agencies update their Urban Water Management Plans to ensure that planning for the water needs of future growth is accommodated in a timely manner. However, CEQA requires the determination of significance to be based on a comparison between *existing* water supply and infrastructure and expected future demand. Although ensuring a reliable water supply for urban and other water demands in 2035 may be possible, the current, existing water supply and infrastructure would not be able to support the population in the Plan in 2035, and the specific, detailed solutions necessary to assure adequate water supply in 2035 have not yet been developed. Through its influence on regional growth, the 2008 RTP would make a cumulatively considerable contribution to this **significant impact.**

Comparison With The No Project Alternative

In the No Project alternative, the population of the SCAG region grows by 5.14 million people, however no regional transportation investments are made above the existing programmed projects. The population distribution follows past trends, uninfluenced by additional transportation investments. The number of households and the employment are less than the Plan due to the absence of the economic benefits conferred by the Plan.

Direct Impacts

With fewer transportation projects than the 2008 RTP, the direct effects of the No Project Alternative on water resources would be reduced when compared with the 2008 RTP. As the currently planned projects included in the No Project alternative (those transportation projects that would occur regardless of the 2008 RTP adoption) are built, the impacts owing to increased roadway runoff and drainage patterns would remain significant. The impacts to groundwater infiltration caused by the increased impervious surfaces of roadway projects, and to increased flooding hazards would be less than significant (with the mitigation measures described for Impacts 3.15-1 through 3.15-3).

The proposed Plan's transportation project related impacts to water quality, groundwater recharge, and flooding would be greater than the No Project Alternative.

Cumulative Impacts

Cumulatively, both the Plan and the No Project would potentially impact water quality, groundwater recharge, flood hazards, wastewater treatment capacity, and water supply. In the No Project alternative, new development would occur to accommodate the same increase in population as projected for the proposed Plan. To reduce land consumption, the Plan includes land use measures that encourage centers-based development, re-development and in-fill where feasible. These measures are largely absent in the No Project alternative. The impacts to water quality would be different in the No Project alternative, as seen in **Table 3.15-11**, which shows the impaired waters impacted by the No Project alternative developments (compared to **Table 3.15-10**, which shows impaired waters impacted by the Plan). The difference in projected urbanized acreage between the Plan and No Project is significant, with the Plan adding approximately ten percent of the existing urbanized land in the region. In comparison, No Project is projected to add over 30 percent to existing urbanized land. Because of the significant difference in urbanization and vacant land consumption, the cumulative impacts associated with urban development would be reduced in the Plan compared with the No Project alternative.

The cumulative impacts on wastewater service capacity, due to the growth expected between the base year and 2035, would be approximately the same in the No Project alternative and the Plan. Because the total population in each county is constant between the No Project alternative and the Plan, Imperial, Los Angeles, Riverside and San Bernardino counties would be at or above their existing wastewater treatment capacities. Though it is expected that new treatment capacities will be added as future demand requires, the relation between future growth and current treatment capacities in the No Project alternative and in the Plan creates a finding of significant impact on wastewater services.

Table 3.15-11:
Impaired Water Bodies (303(d) Occurring Within 150 Feet of a Freeway, Transit, or Freight Rail Project in the No Project Alternative

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 & 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 (was 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, was part of Conejo Creek Reach 3 on 1998 303d list)	Ammonia, ChemA (tissue), Chlordane, DDT, Dieldrin, Endosulfan (tissue), Fecal Coliform, PCBs, Sedimentation/Siltation, Sulfates, Total Dissolved Solids, Toxaphene (tissue & sediment), Toxicity
Calleguas Creek Reach 12 (was 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 Cr Reach 4 and part of Reach 3 on 1998 303d list)	Ammonia, ChemA (tissue), Chlordane, Chloride, DDT, Dieldrin, Endosulfan (tissue), Fecal Coliform, PCBs, Sulfates, Total Dissolved Solids, Toxaphene (tissue & 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, Toxaphene
Laguna Canyon Channel	Sediment Toxicity
Los Angeles River Reach 1 (Estuary to Carson Street)	Ammonia, Cadmium, Coliform Bacteria, Copper, Dissolved, Cyanide, Diazinon, Lead, Nutrients (Algae), pH, Trash, Zinc, Dissolved
Los Angeles River Reach 2 (Carson to Figueroa Street)	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, Trichloroethylene/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

Table 3.15-11 (Continued)
Impaired Water Bodies (303(d) Occurring Within 150 Feet of a Freeway, Transit, or Freight Rail Project in the No Project Alternative

Impaired Water Body	Pollutants
Verdugo Wash Reach 1 (LA River to Verdugo Rd.)	Coliform Bacteria, Trash
Walnut Creek Wash (Drains from Puddingstone Res)	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 & sediment), Lead (tissue), PCBs, Phenanthrene, Pyrene, Zinc (sediment)

SOURCE: SCAG analysis of California State Water Resources Control Board 2006 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

Due to this pattern of greater urban development, the No Project alternative's cumulative impacts to both water quality and flood risk would be greater than those associated with the 2008 RTP.

The No Project Alternative would distribute growth among water supply agencies similarly to the Plan (see **Table 3.15-6**). The *existing* water supply and infrastructure would not be able to support the population in the No Project alternative in 2035. The proposed Plan's impacts on water supply would be approximately the same as the No Project alternative, with the possible exception of increased multi-family housing in the Plan; multi-family housing is traditionally more water efficient than single-family housing.

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CHAPTER 4
Alternatives

Introduction

The purpose of this section is to evaluate and compare the expected environmental effects of alternatives to the proposed 2008 RTP. CEQA Guidelines require that an EIR evaluate a "reasonable range" of potentially feasible alternatives that would attain most of the basic objectives of the Plan but would avoid or substantially lessen one or more of the significant environmental effects. In addition, a "No Project" Alternative must be evaluated and the "Environmentally Superior Alternative" must be identified. The No Project Alternative must discuss what would be expected to occur in the foreseeable future if no plan is approved. The EIR must compare the relative impacts of the alternatives with the goal of fostering informed decision-making and public participation.

In accordance with these guidelines, this PEIR analyzes a range of three alternatives in addition to the proposed 2008 RTP:

- The No Project Alternative
- The Modified 2004 RTP Alternative
- The Envision Alternative

The major characteristics of these alternatives compared to the proposed Plan are provided in **Table 4-1.**

TABLE 4-1
CHARACTERISTICS OF THE 2008 RTP ALTERNATIVES

	No Project	Plan	2004 Modified	Envision
Total Population in 2035	24,056,000	24,056,000	24,056,000	24,056,000
Total Households in 2035	7,710,000	7,710,000	7,710,000	7,710,000
Total Employment in 2035	10,287,000	10,287,000	10,287,000	10,287,000
Transportation Network	Baseline[1]	Plan	2004 RTP	Plan
Land-Use-Transportation Measures	None beyond existing	In-fill and TOD[2] where feasible	None beyond existing	Aggressive infill and TOD in the existing urban centers

[1]Baseline refers to all in-place regionally significant projects and on going travel demand programs, in addition to those projects included in the 2004 RTIP with NEPA clearance as of December 2006.
[2]Transit-Oriented Development
Source: SCAG. (2007)

No Project Alternative

The No Project Alternative includes projects and programs that would be reasonably foreseeable, absent adoption of the 2008 RTP. These projects include all in-place regionally significant highway and transit facilities, services and activities; all on-going travel demand management (TDM) or transportation system management (TSM) activities; and completion of all regionally significant projects that are currently under construction or undergoing right-of-way acquisition. These reasonably foreseeable projects also include projects listed in the first year of the 2006 Regional Transportation Improvement Program (RTIP) and have completed the National Environmental Policy Act (NEPA) process by December 2006.

The 2035 regional total population, households and employment would be the same for the No Project Alternative and the 2008 Plan. Although the totals are held constant at the regional level, growth distribution would differ at the county level. The No Project Alternative does not include land-use-transportation measures and includes fewer transportation projects. As a result, the Plan and the No Project Alternative provide differing mobility, and different employment and housing options, resulting in different distributions of growth in 2035.

Aesthetics and Views

Since the No Project Alternative includes fewer transportation projects than the 2008 RTP, it would have a lesser impact in terms of obstructing views and scenic resources, creating contrasting land uses and adding visual elements to existing natural, rural, and open space areas. The No Project would not affect any State Scenic Highways or vista points.

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 disturbance of natural lands thereby reducing potential 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 proposed Plan also includes transportation improvements that facilitate access to undeveloped lands, making those lands more attractive for development than under the No Project Alternative. The No Project Alternative could result in unplanned growth extending in to more vacant, open space/recreational and agricultural lands than under the Plan, thereby adding urban elements to previously undisturbed landscapes. As such, it is expected that the No Project Alternative and the Plan would cumulatively create similar types of contrasts with the overall visual character of the existing landscape setting. However, it is anticipated that the land use planning strategies included in the 2008 RTP will minimize consumption of vacant, open space/recreation and agricultural lands compared to the No Project Alternative (about 200,000 acres under the Plan and about 655,000 acres under the No Project Alternative). The Plan impacts would be less than the No Project impacts.

Air Quality

As indicated in **Tables 3.2-6 and 3.2-7** (with the exception of NOx in Western MDAB) the No Project Alternative would result in greater air quality impacts of criteria pollutants and toxic air contaminants (TACs) when compared to the 2008 RTP.

Tables 3.2-6 and 3.2-7 summarize the No Project and Plan criteria pollutant emissions estimated by nonattainment areas and SCAG counties, respectively. When compared to emissions from the current conditions, the No Project would result in greater or the same emissions of ROG, NOx, CO and SOx for all nonattainment areas and counties, except for NOx in the MDAB. No Project emissions of PM10 for all nonattainment areas and SCAG counties would be greater than PM10 emissions for current conditions. Heavy-duty truck PM10 exhaust emissions estimated by SCAG's model includes most of the diesel-related TAC emissions. As shown in **Table 3.2-8**, the No Project PM10 emissions from heavy-duty trucks would be expected to decrease from 2008 levels for each county, but be greater or the same as Plan emissions.

The No Project Alternative would result in less construction activity than implementation of the 2008 RTP. Nonetheless, the No Project Alternative includes some major construction projects, and thus the No Project Alternative would be expected to generate a substantial amount of construction activity that would likely exceed the significance thresholds established in the CEQA Guidelines. This would create 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 2008 RTP. The 2008 RTP conforms with the local air quality management plans, and thus cumulative impacts are considered less than significant. The No Project Alternative, however, may not conform to the local air quality management plans and could have a significant cumulative impact. As with the project the increase in emissions is considered significant.

Although the No Project Alternative would include fewer projects, it would result in slightly more greenhouse gas emissions than the Plan Alternative. Specifically, Future (2020) No Project conditions would result in 202.44 million metric tonnes of CO2e and Future (2035) No Project conditions would result in 233.77 million metric tonnes of CO2e, whereas the 2008 RTP Alternative would result in 201.10 million metric tonnes of CO2e in 2020 and 226.17 million metric tonnes of CO2e in 2035. Given that both alternatives would result in a net increase in greenhouse gas emissions over 2008 levels, the No Project Alternative would result in a similarly significant impact since it would increase CO2e emissions in both 2020 and 2035, inconsistent with statewide reduction goals.

Biological Resources

With fewer transportation projects than the 2008 RTP, the direct effects of transportation projects in the No Project Alternative would result in fewer disturbances of biological resources. As projects included in the No Project Alternative (which would occur regardless of adoption of the 2008 RTP) are built, the impacts to natural vegetation, sensitive species and communities, habitat

connectivity, near-road human disturbances, disturbances associated with construction generated smoke, light and noise, potential displacement of riparian and wetland areas, and siltation of water bodies would occur, but due to the reduced number of projects, would be expected to be lesser than under the Plan.

Construction impacts related to trampling of vegetation (Impact 3.3-4), would be less than under the 2008 RTP, as fewer projects would be built. Neither the No Project Alternative nor the 2008 RTP would conflict with provisions of adopted Habitat Conservation Plans or Natural Communities Conservation Plans.

The No Project Alternative is expected to accommodate the same increase in total population as the 2008 RTP. However, the 2008 RTP focuses development in existing and emerging centers, along transportation corridors, promotes transit-oriented and mixed use development and improves the regional jobs-housing balance, includes land use measures that support centers-based development, re-development and in-fill where feasible. As a result of these growth strategies, the 2008 RTP is expected to consume less acreage than the No Project Alternative. Therefore, the No Project Alternative would have greater impacts than the 2008 RTP.

The No Project Alternative's cumulative impacts to biological resources due to urban development would be expected to be greater than those of the 2008 RTP. Under the No Project future urbanization of a greater magnitude than the Plan would be expected to affect natural vegetation, habitat, and other biological resources.

Cultural Resources

Under the No Project alternative, there would be no new transportation projects beyond those projects that would occur without the Plan, With fewer transportation projects than the 2008 RTP, fewer areas would be impacted by excavation and construction activities due to transportation activities, resulting in fewer potential impacts to cultural and paleontological resources and human remains. The total acreage of undisturbed areas occurring within 150 feet of a freeway, transit, or freight rail project in the 2008 RTP is 11,700 acres compared to only 3,200 acres under the No Project alternative. Although the proposed Plan also includes additional transportation projects that facilitate access to natural lands that would be less accessible or inaccessible with the No Project Alternative. This improved accessibility could facilitate population and economic growth to areas of the region that are currently not developed.

The No Project alternative's cumulative impacts to cultural resources due to urban development would be expected to be similar to those of the 2008 RTP. Both scenarios include the same increases in population, households and employment. Future urbanization would be expected to impact existing historic resources and undisturbed areas that may contain cultural resources. It is nevertheless expected that the 2008 Plan would consume less acreage of vacant land than the No Project alternative, resulting in less disturbance and fewer impacts. The No Project alternative's cumulative impacts to cultural resources would be similar those of the 2008 RTP.

Energy

The consumption of transportation energy under the No Project would exceed that for the Plan Alternative due to an increase in VMT and VHT spent in delay as well as fewer work opportunities within 45 minutes of housing. Specifically, the No Project Alternative would consume approximately 34,250 thousand gallons of transportation fuel per day and the Plan Alternative would consume approximately 32,940 thousand gallons per day. More electricity would also be consumed under the No Project Alternative than the Plan Alternative. Therefore, the significant impact 3.5-2 identified for the Plan would be greater for the No Project Alternative. The direct impact 3.5-1, relating to energy use for construction, would likely be less under the No Project Alternative than the Plan Alternative since fewer new projects would be built. The impact 3.5-3, relating to consistencies with climate change policies, would likely remain significant under the No Project Alternative due to the increase in VMT, delay and reduced opportunities to live closer to work. The cumulative impact 3.5-4 would likely still be cumulatively considerable and significant under the No Project Alternative.

Geology, Soils, and Seismicity

With fewer transportation investments than the Plan Alternative, the No Project Alternative has less risk of damage to transportation infrastructure through surface rupture, ground shaking, liquefaction, and landsliding due to seismic events. Roadwork for the transportation projects would have less risk of increasing long-term erosion potential and slope failure. Local geology would have lower risk of potentially significant impacts to property and public safety due to subsidence and the presence of expansive soils. Under the No Project alternative, there would be no new transportation projects beyond those projects that would occur without the Plan.. Under the No Project, fewer areas would be impacted by excavation and construction activities. The increased earthwork associated with the Plan could result in greater soil instability and erosion impacts. However, at the regional level, the No Project and the Plan accommodate the same increase in population. Therefore, both the No Project and the Plan would expose the same number of people to potential seismic hazards. Due to these competing factors, and the general seismic activity of the Southern California region, the proposed 2008 Plan's impacts to geological resources would be similar to the No Project alternative.

Hazardous Materials

With fewer transportation projects, most of the potential direct and cumulative impacts of the No Project Alternative with respect to hazardous materials would likely be less than under the Plan Alternative. These impacts include risk related to transport of hazardous materials, the proximity of hazardous materials use and transportation to schools, and the risk of encountering previously contaminated sites during construction. The decreased mobility associated with the No Project Alternative, especially for heavy-duty trucks, would have a greater cumulative impact on the transport of hazardous materials in counties outside of the SCAG region.

Because there would be fewer projects built, it is possible hazardous materials shipments would choose less congested routes than through the SCAG region, resulting in fewer hazardous

materials transported than under the Plan. However, without the transportation system improvements incorporated in the 2008 RTP, vehicle miles traveled and vehicle hours of delay would increase more by 2035 for the No Project Alternative than for the Plan Alternative. Thus, there would be more opportunities for accidents with vehicles transporting hazardous materials in the No Project Alternative than in the Plan Alternative. Also, with fewer new roadways constructed, hazardous materials transport would be concentrated on existing routes, and could not be diverted to dedicated lanes. In general, the No Project impacts could be greater than the Plan impacts.

Cumulatively, with the construction of fewer new lane miles and other transportation projects in the No Project Alternative compared to the Plan, more transportation demand would be transferred to surrounding counties, and therefore, more hazardous materials transportation would be facilitated in these counties. Thus, the cumulative impacts for the Plan Alternative would be greater than the No Project Alternative.

Land Use

The No Project contains fewer transportation investments than the Plan Alternative. 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 Alternative 7,800 acres of business land uses and about 6,500 acres of residential land uses would be affected by transportation projects. The Plan impacts would be greater than the No Project impacts for Impact 3.8-1 and 3.8-2.

The No Project Alternative is expected to accommodate the same increase in total population as the proposed Plan, but more projects would be implemented under the 2008 RTP than the No Project. However, the Plan includes land use measures that would help reduce the displacement or disruption of existing communities. These mitigation measures are absent in the No Project Alternative. The compact growth strategies, with an emphasis on infill and redevelopment, under The Plan would potentially result in the displacement more homes and businesses than the spread out land use patterns under the No Project. The Plan impacts would be greater than the No Project.

Noise

The No Project Alternative impacts associated with noise would be less than those of the 2008 RTP. With fewer transportation projects being built under the No Project Alternative, there would be substantially less construction noise affecting sensitive receptors. Because fewer projects would be built, construction impacts due to grading, power tools, earth moving, groundborne vibrations, etc. for the No Project Alternative would be less than for the 2008 RTP.

Since the No Project Alternative includes fewer transportation system improvements, the impacts of noise related to operations would be less than under the 2008 RTP because of a decrease in speed, and fewer new transit noise sources.

While the construction noise is temporary and short term at the project level, the cumulative construction noise region wide could be significant. This ambient noise increase could be related to: aircraft overflights, port noise, ship horns, railroads, as well as freeway, arterial and transit noise. Through the construction of transportation projects, and increases in traffic volume and speed, the 2008 RTP projects would have greater noise impacts than the No Project.

Open Space

The No Project Alternative is expected to accommodate the same increase in total population as the proposed Plan Alternative. However, the Plan Alternative 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 absent in the No Project Alternative (although individual jurisdictions could adopt some of the Compass growth strategies independently of the RTP). Under the No Project Alternative, up to approximately 655,000 acres of vacant, open space and agricultural lands would be consumed, compared to 200,000 under the Plan.

The proposed 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. This improved accessibility under the Plan Alternative would help facilitate population and economic growth in areas of the region that are currently not developed. However, land use policies would seek to strictly limit development outside targeted areas. Without coordinated regional growth strategies, outlying areas could continue to be developed due to inexpensive land prices. These areas would likely include agricultural lands and open spaces or lands adjacent to agricultural lands and open spaces. The total vacant land consumed under the Plan would be less than under the No Project. The No Project impacts on open space would be greater than the 2008 Plan.

Population, Employment and Housing

The No Project contains fewer transportation investments than the Plan Alternative. 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 Alternative 7,800 acres of business land uses and 6,500 acres of residential land uses would be affected by transportation projects. The Plan impacts would be greater than the No Project impacts for Impact 3.2-1, 3.2-2, and 3.2-3.

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

displacement, disruption or diversion of existing communities. These mitigation measures are absent in the No Project Alternative. The proposed Plan 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 Plan could help facilitate population and economic growth in areas of the region that are currently not 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 655,000 acres of vacant, open space/recreation and agricultural lands, while the plan would consume about 200,000 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, employment and households. Therefore, the No Project Alternative's cumulative impacts to population, households, and employment would be approximately the same as those of the 2008 RTP.

Public Services and Utilities

Under the No Project Alternative, the need for public facilities and solid waste services for transportation projects would be less than under the Plan Alternative because fewer projects would be built. The potential that building the projects would disrupt or sever underground utility lines also would be less in the No Project Alternative than in the Plan Alternative because there are fewer transportation projects.

Cumulatively, congestion due to a lack of additional transportation improvement projects and a dispersed population distribution would result in emergency vehicle response times that are worse in the No Project Alternative than under the Plan Alternative.

The cumulative need for additional emergency personnel, schools, and solid waste services to accommodate the population would be the same in the No Project Alternative as in the Plan Alternative.

Security and Emergency Preparedness

Implementation of the 2008 RTP would affect the security and emergency preparedness in the region due to the vast expanse of transportation infrastructure. The security and emergency preparedness goals outlined in the Plan Alternative aim to assist the region in the planning, preparation and response to emergencies, whether caused by natural or human elements.

The No Project Alternative would result in slightly more than or equal risk for wildfire and/or mudslide destruction, compared to the Plan Alternative. The Plan includes land use measures that would discourage development in areas where wildfire potential is high, such as on the urban fringes. This reduction could reduce the risk to life and property during wildland fires and mudslides in fire ravaged areas. The No Project Alternative would have a greater cumulative effect than the Plan Alternative in inducing growth in areas with high threats of wild fires.

Under the Plan, the RTP forecasts expenditures of $10 billion for safety related projects and services. This is in addition to safety standards considered as part of every project design. As a result, implementation of the Plan is anticipated to minimize the threat and impact to lives, property, the transportation network and the regional economy. Therefore the No Project would result in greater impacts than the Plan.

Transportation

The No Project Alternative would result in greater than or equal impacts to transportation facilities, compared to the 2008 RTP. The No Project Alternative would generally be expected to result in more miles traveled and more delay. The No Project Alternative would result in 563 million daily VMT, more than the 2008 RTP's 552 million daily VMT. Daily hours of delay in the No Project Alternative would be 8.1 million person-hours of delay for all vehicles and 0.593 million vehicle-hours of delay for heavy-duty trucks. Comparatively, the 2008 RTP would result in 6.6 million person-hours of delay for all vehicles and 0.467 million vehicle-hours of delay for heavy-duty trucks. The differences between No Project Alternative and 2008 RTP impacts to transportation are detailed in **Tables 3.14-11 and 3.14-14**.

The No Project Alternative would result in fewer work opportunities within 45 minutes travel time than the Plan. Specifically, 76.2 percent of work trips could be made within 45 minutes by auto and 40.1 percent by transit with the No Project Alternative, compared with 80 percent within 45 minutes by auto and 44 percent by transit with implementation of the 2008 RTP.

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, VHT, and heavy-duty truck VHT data reported for the No Project. The No Project would have greater cumulative adverse transportation impacts than the 2008 RTP.

Water Resources

With fewer transportation projects than the 2008 RTP, the direct effects of the No Project Alternative on water resources would be less than under the 2008 RTP. However, as the currently planned projects included in the No Project Alternative are built (which would occur regardless of adoption of the 2008 RTP), the impacts due to increased road runoff and drainage patterns would remain significant.

The No Project includes the construction of fewer lane miles, and would result in fewer acres of impervious surface added to the region (Impacts 3.15-2 and 3.15-3). These impacts would be less than those caused by implementation of the 2008 RTP.

Cumulatively, both the Plan and the No Project would potentially impact water quality, groundwater recharge, flood hazards, wastewater treatment capacity, and water supply. In the No Project Alternative, new development would occur to accommodate the same increase in population as projected for the proposed Plan. However, the Plan contains land use strategies to reduce the amount of land consumed by that growth. These strategies are absent in the No

Project alternative, although municipalities may still independently pursue them in their general plans.

Due to the greater amount of projected urbanization, the cumulative impacts associated with urban development to water quality, groundwater recharge, and flood hazards would be greater in the No Project alternative.

The cumulative impacts on wastewater service capacity, due to the growth expected between the base year and 2035, would be approximately the same in the No Project Alternative and the Plan. The total population in each county is relatively constant between the No Project Alternative and the Plan, such that Imperial, Los Angeles, Riverside and San Bernardino Counties would be at or above the existing capacity for wastewater treatment. Though it is expected that services would be added as they are needed, for the purpose of determining significance of the impact, the future wastewater flow must be compared to the existing treatment capacity, and the impact of the No Project Alternative is significant and of similar magnitude to the Plan.

The *existing* water supply and infrastructure would not be able to support the population in the No Project Alternative in 2035. The region's water agencies are continually responding to new information on population growth and challenges to future supply, but the *existing* supply still falls short of future demand. The impact would remain significant and similar in magnitude to the Plan Alternative.

Modified 2004 RTP Alternative

The Modified 2004 RTP Alternative is an update of the adopted 2004 RTP, reflecting the most recent growth estimates and transportation planning decisions. The transportation investments for this alternative include all of the projects in the 2004 RTP. Generally, transportation investments included in the Modified 2004 RTP are similar to those in the 2008 RTP. This alternative also includes a modification of the 2004 RTP in that it updates the growth projection, and it extends the planning horizon from 2030 to 2035. As an Alternative to the 2008 RTP, the Modified 2004 RTP Alternative does not include most of the land use-transportation strategies utilized in the 2008 RTP. The Modified 2004 RTP Alternative includes the same number of people, households, and jobs as the Plan, though these are distributed differently due to the absence of land use-transportation strategies.

Aesthetics and Views

The direct impacts of the Modified 2004 RTP Alternative on aesthetics and views would be the same as those of the Plan Alternative because the transportation projects included in both Alternatives are generally the same. The Modified 2004 RTP would have similar impacts on obstructing scenic resources, creating contrasting land uses, and adding visual elements to existing natural, rural, and open space areas. The Modified 2004 RTP Alternative would have similar impacts on state scenic highways and vista points. New development to accommodate the additional population would be greater cumulatively in the Modified 2004 RTP Alternative than in

the Plan Alternative because the Modified 2004 RTP Alternative does not have the growth strategies that conserve vacant land. This development would create greater contrasts with the overall visual character of the existing landscape setting in the Modified 2004 RTP Alternative than in the Plan Alternative.

Air Quality

The Modified 2004 RTP Alternative would result in an increase in criteria pollutants compared to the 2008 RTP. As show in **Table 4.2**, when compared to the 2008 Plan, the Modified 2004 RTP Alternative would result in increased emissions of NOx, and CO for Los Angeles, Riverside, and San Bernardino counties. Under the Modified 2004 RTP, NOx would be increased by 20 percent compared to the Plan in Ventura County. Nonetheless, compared to existing pollutants, emissions would still be less under the 2004 RTP Alternative than existing except for PM10 and PM2.5. Because of the increase in PM10 and PM2.5 impacts would be significant, and slightly greater than the Plan.

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 2004 RTP Alternative would be slightly greater than those under the 2008 RTP. The 2008 RTP conforms with the local air quality management Plans and cumulative impacts are less than significant. It is not clear if the 2004 RTP Modified emissions would conform to the local air quality management plans; as with the Plan the increase in emissions would be considered significant.

As shown in **Table 4.3,** the 2004 RTP Alternative would result in an increase in Greenhouse Gases of 25.13 tonnes per year in 2020 and 57.12 tonnes per year in 2035, compared to increases of 24.31 tonnes per year in 2020 and 51.41 tonnes per year in 2035 for the Plan. The 2004 RTP Alternative would have 3 percent greater Greenhouse Gas emissions in 2020 and 11 percent greater emissions in 2035 compared to the Plan. Therefore, the Modified 2004 RTP Alternative would have a significant impact related to greenhouse gas emissions.

TABLE 4.2

CRITERIA POLLUTANT EMISSIONS BY COUNTY – 2035 MODIFIED 2004 RTP VS 2035 PLAN (IN TONS PER DAY)

County		ROG Summer	ROG Annual	NOx Summer	NOx Annual	NOx Winter	CO Winter	PM10 Annual	PM2.5 Annual	SOx Annual
Los Angeles	*2004 Modified*	40	40	60	60	64	313	72	11	1
	Plan	40	40	59	60	63	310	71	111	1
	Difference	0	0	1	0	1	3	1	0	0
	% Difference	0%	0%	**2%**	0%	**2%**	**1%**	**1%**	0%	0%
Imperial	*2004 Modified*	4	3	8	8	8	27			0
	Plan	4	3	8	8	8	28			0
	Difference	0	0	0	0	0	-1			0
	% Difference	0%	0%	0%	0%	0%	**-4%**			0%
Orange	*2004 Modified*	15	15	18	18	20	112	26	4	0
	Plan	15	15	18	18	19	107	26	4	0
	Difference	0	0	0	0	-1	-5	0	0	0
	% Difference	0%	0%	0%	0%	**5%**	**5%**	0%	0%	0%
Riverside	*2004 Modified*	11	10	18	18	18	79	24	4	0
	Plan	11	10	17	17	18	77	24	4	0
	Difference	0	0	1	1	0	2	0	0	0
	% Difference	0%	0%	**6%**	**6%**	0%	**3%**	0%	0%	0%
San Bernardino (SCAB and MDAB Portion)	*2004 Modified*	10	9	20	20	20	72	15	2	0
	Plan	10	9	19	19	19	69	14	2	0
	Difference	0	0	1	1	0	3	1	0	0
	% Difference	**0%**	0%	**5%**	**5%**	**5%**	**4%**	**7%**	0%	0%
Ventura	*2004 Modified*	4	4	5	5	6	30			0
	Plan	4	4	5	5	5	30			0
	Difference	0	0	0	0	1	0			0
	% Difference	0%	0%	0%	0%	**20%**	0%			0%

Note: SCAB portions only of Los Angeles, Riverside, and San Bernardino

Biological Resources

The transportation investments for the Modified 2004 RTP Alternative are similar to those in the 2008 RTP. Therefore, the direct impacts to natural vegetation, sensitive species and communities, habitat connectivity, near-road human disturbances, disturbances associated with construction-generated smoke, light and noise; potential displacement of riparian and wetland areas, and siltation of water bodies would similar to the 2008 RTP.

Construction impacts related to trampling of vegetation would be also be similar to those in the 2008 RTP. Neither the Modified 2004 RTP Alternative nor the 2008 RTP would conflict with provisions of adopted Habitat Conservation Plans or Natural Communities Conservation Plans.

New development to accommodate the additional population would be greater cumulatively in the Modified 2004 RTP Alternative than in the Plan Alternative because the Modified 2004 RTP Alternative does not have the growth strategies that conserve vacant land. The Modified 2004 RTP Alternative would be expected to consume more land when compared to the 2008 RTP, and therefore would cumulatively affect more biological resources.

Cultural Resources

As mentioned above, the transportation investments for the Modified 2004 RTP Alternative are would be similar to those included in the 2008 RTP. Therefore, the direct impacts to cultural and paleontological resources and human remains would be similar to the impacts of the 2008 RTP.

The Modified 2004 RTP Alternative's cumulative impacts due to urban development patterns would be expected to be greater than those of the 2008 RTP. The Modified 2004 RTP Alternative would accommodate similar population, households, and employment as the 2008 RTP, but without implementation of policies that create a more compact urban form. Thus, the urban development patterns associated with the Modified 2004 RTP Alternative would be expected to cumulatively disturb more previously undisturbed areas when compared to the 2008 RTP.

Energy

The Modified 2004 includes all of the projects from the 2004 RTP, which are generally similar to those in the 2008 RTP. As a result, Impact 3.5-1, which relates to the use of non-renewable energy resources in construction and expansion of the regional transportation system, would be similar for the Modified 2004 RTP Alternative as for the 2008 RTP, since the transportation system investments in the two Alternatives similar.

Transportation energy usage (Impact 3.5-2) is projected to be slightly higher under the Modified 2004 RTP Alternative compared with the 2008 RTP. Specifically, the Modified 2004 RTP Alternative would consume approximately 33,750 thousand gallons of transportation fuel per day and the 2008 RTP Alternative would consume approximately 32,940 thousand gallons per day. Both electricity and natural gas consumption are projected to be generally similar for the Modified 2004 RTP Alternative and the 2008 RTP.

TABLE 4.3
2004 MODIFIED RTP ALTERNATIVE GREENHOUSE GAS EMISSIONS [1]

Area and Source	Carbon Equivalent (Million Metric Tonnes per Year) [2]				
	Existing (2008)	Future No Project (2020)	2004 RTP Alternative (2020)	Future No Project (2035)	2004 RTP Alternative (2035)
Imperial County					
Construction	0.04	0.04	0.03	0.04	0.03
Mobile	1.36	1.90	1.86	2.45	4.35
Electricity	0.59	0.93	0.87	1.17	1.04
Natural Gas	0.37	0.59	0.55	0.74	0.65
Total	2.36	3.46	3.31	4.40	6.07
Los Angeles County					
Construction	0.66	0.65	0.62	0.66	0.63
Mobile	42.28	46.05	45.68	51.19	50.82
Electricity	25.88	27.79	27.80	29.73	29.70
Natural Gas	24.38	26.25	26.25	28.11	28.07
Total	93.20	100.74	10035	109.69	109.22
Orange County					
Construction	0.10	0.10	0.13	0.10	0.14
Mobile	13.20	14.50	14.61	15.80	16.55
Electricity	7.72	8.50	8.55	8.84	9.31
Natural Gas	8.65	9.55	9.60	9.93	10.47
Total	29.67	32.65	32.89	34.67	36.47
Riverside County					
Construction	0.46	0.46	0.45	0.46	0.45
Mobile	10.49	13.38	13.43	18.10	17.08
Electricity	5.15	7.17	7.07	9.54	9.05
Natural Gas	4.31	6.02	5.93	8.03	7.60
Total	20.41	27.03	26.88	36.13	34.18
San Bernardino County					
Construction	0.33	0.33	0.32	0.33	0.33
Mobile	13.13	16.85	16.63	22.68	21.65
Electricity	5.84	7.40	7.51	9.44	9.44
Natural Gas	4.29	5.44	5.52	6.94	6.93
Total	23.59	30.02	29.98	39.39	38.35
Ventura County					
Construction	0.09	0.09	0.10	0.05	0.06
Mobile	3.37	3.75	3.73	4.26	4.34
Electricity	2.13	2.44	2.43	2.69	2.71
Natural Gas	1.97	2.26	2.25	2.49	2.51
Total	7.56	8.54	8.51	9.49	9.62
Total Emissions	176.79	202.44	201.92	233.77	233.91
2004 RTP Alternative Compared to No Project (2020 and 2035)		(52)		0.14	
2004 RTP Alternative Compared to Existing		25.13		57.12	

NOTES:
1. The table does not include all sources of GHG emissions (e.g., industrial processes, agriculture, etc.).
2. Please refer to Appendix B for a complete description of the methodology used to obtain GHG emissions.

Although the greenhouse gas emissions would be slightly lower under the 2004 Modified RTP than the 2008 RTP, the 2004 RTP Alternative would be less likely to fully address California's Climate Change Action Plan due to the lack of an integrated land use and transportation system (Impact 3.5-3). Furthermore, transportation fuel use, the main contributor to greenhouse gas emissions in California and the SCAG region, is expected to be higher under the Modified 2004 RTP Alternative when compared to the 2008 RTP Alternative. Therefore, the Plan impacts would be less when compared to the Modified 2004 RTP Alternative.

Cumulative Impact 3.5-4 is a significant impact relating to the overall growth in the use of non-renewable energy resources for the SCAG region. The analysis of electricity and natural gas consumption indicates that the Modified 2004 RTP Alternative would consume about the same amount of energy versus the Plan Alternative, still resulting in an overall increase in regional energy consumption under the Modified 2004 RTP Alternative and a cumulatively considerable impact. Furthermore, as mentioned above, transportation energy consumption under the Modified 2004 RTP Alternative would be slightly higher when compared to the Plan Alternative. In addition, although the analysis of electricity and natural gas consumption indicates that the 2004 RTP Alternative would consume slightly less energy versus the Plan Alternative, the overall increase in regional energy consumption under the Modified 2004 RTP Alternative would still be cumulatively considerable. Therefore, due to lower transportation energy consumption, the Plan impacts would be less than the Modified 2004 Alternative.

Geology, Soils, and Seismicity

With generally similar transportation investments as the Plan Alternative, the Modified 2004 RTP Alternative has a similar risk of damage to transportation infrastructure through surface rupture, ground shaking, liquefaction, and landsliding due to seismic events. Similar amounts of roadwork for the transportation projects under the two alternatives would have a similar risk of increasing long-term erosion potential and slope failure. Local geology would pose the same risk of potentially significant impacts to property and public safety. The Modified 2004 RTP Alternative would accommodate the same total population, households, and employment as the 2008 RTP, but without implementation of policies that create a more compact urban form. However, under both alternatives, the same number of people would be exposed to risk from potential geological upset. As a result, the cumulative impacts on geological resources of the Modified 2004 RTP Alternative are expected to be similar to those of the Plan.

Hazardous Materials

Impact 3.7-1, and 3.7-2 which relate to the routine transport, use, or disposal of hazardous materials**,** and the risk of upset, would be similar under the Modified 2004 RTP compared to the Plan.

The Modified 2004 RTP Alternative includes generally similar transportation investments as the 2008 RTP, but does not have the growth strategies to reduce VMT and focus growth in urbanized areas. However, because the transportation network would be similar under both Alternatives, it is expected that Impact 3.7-3, which relates to the risk of release of hazardous materials within

one-quarter mile of a school, would be the similar for the Modified 2004 RTP Alternative as for the 2008 RTP.

Both Alternatives include generally the same transportation investments and would result in similar amounts of construction. However, the Plan includes growth strategies that emphasize compact development and reuse in urban areas, where there brownfields and other contaminated sites are more likely to occur. Therefore, Impact 3.7-4, which relates to the risk of disturbing contaminated sites during construction, would be lesser for the Modified 2004 RTP Alternative than the Plan.

Cumulative Impact 3.7-5, which relates to hazardous materials transportation impacts on neighboring counties, would be greater for the 2004 RTP Alternative than for the 2008 RTP, as mobility could decrease slightly relative to the Plan, leading to greater pressure on the transportation systems of other counties.

Cumulative Impact 3.7-6, which relates to the risk of disturbing contaminated sites during construction related to the region's growth as a whole, would be expected to be reduced under the Modified 2004 RTP Alternative since growth policies would not be included that would emphasize infill and redevelopment versus use of new land.

Land Use

Since the Modified 2004 RTP Alternative has a transportation network that is largely similar to the Plan Alternative, its direct impact on land use would be similar to the Plan Alternative. The Modified 2004 RTP Alternative does not have the same growth strategies to distribute the future population as the Plan Alternative and as a result would increase urbanized acres in the region by approximately 316,000 acres, an increase of 61,000 acres over the Plan. The Modified 2004 RTP Alternative has less of an emphasis on focusing development in existing and emerging centers, along transportation corridors, promoting transit-oriented and mixed uses development and improving regional jobs-housing balance. As a result it would be expected to create fewer inconsistencies with general plans than the Plan Alternative.

Cumulative impacts of new development to accommodate the population in the region would be greater in the Modified 2004 RTP Alternative than in the Plan Alternative, as the Modified 2004 RTP Alternative does not have the growth strategies that conserve vacant land.

Noise

The transportation improvements in the Modified 2004 RTP are similar to those in the 2008 RTP. Construction noise related to grading, power tools, earth moving, groundborne vibrations, etc. would therefore be generally the same as for the 2008 RTP. The Plan and the 2004 Modified RTP would have similar construction related impacts.

The impact of noise on areas directly located next to transportation facilities would be similar for the Modified 2004 RTP and the 2008 RTP. The projects included in both alternatives would be similar resulting in similar impacts occurring within 150 feet of transportation facilities, both would also likely result in a comparable number of sensitive receptors that would be impacted.

Cumulative noise impacts for the Modified 2004 RTP would also be similar to those from implementation of the 2008 RTP. Construction, ambient, aviation and port noise would be the same between the two alternatives. The Plan would have similar noise impacts to the 2004 Modified RTP Alternative.

Open Space

Since the Modified 2004 RTP Alternative has a transportation network that is largely similar to the Plan Alternative, its direct impacts on open space and agricultural lands would be expected to be similar to the Plan Alternative. However, the Modified 2004 RTP Alternative does not have the same growth strategies to distribute the future population as the Plan Alternative and as a result would increase urbanized acres in the region by approximately 316,000 acres, an increase of 61,000 acres over the Plan. The 2004 Modified RTP Alternative would consume 20,215 acres of open space and 45,405 acres of agricultural lands compared to 11,104 acres of open space and 47,000 of agriculture under the Plan. Although the Plan would consume fewer acres overall and fewer acres of open space specifically, it would result in a slightly greater loss of agricultural lands than the 2004 Modified RTP. Overall, the impacts to open space would be reduced under the Plan.

Cumulative impacts of new development to accommodate the population in the region would be greater in the Modified 2004 RTP Alternative than in the Plan Alternative, as the Modified 2004 RTP Alternative has less of an emphasis on focusing development in existing and emerging centers, along transportation corridors, promoting transit-oriented and mixed uses development and improving regional jobs-housing balance. As discussed above, the 2004 Modified RTP would have greater impacts than the Plan.

Population, Employment and Housing

The Modified 2004 RTP Alternative has the same population, household, and employment growth to the Plan Alternative. The impact of the induced growth from the Modified 2004 RTP Alternative would be similar to the Plan Alternative, although there would be slight differences in the countywide distributions. For example, the 2004 Modified RTP would result in an increase in population, jobs and households in Orange County. Although, because the population households and employment would be the same at the regional level, the Plan impacts would be the same as those associated with the 2004 Modified RTP.

Since the Modified 2004 RTP Alternative contains similar transportation investments as the Plan Alternative, it would have approximately the same impact as the Plan Alternative in terms of displacing businesses and homes and disrupting and dividing communities.

Both the Plan and the 2004 Modified Alternative would result in the same increase in population. However, cumulative impacts of new development to accommodate the additional population would be greater in the Modified 2004 RTP Alternative than in the Plan Alternative because the Modified 2004 RTP Alternative does not have the growth strategies that conserve vacant land.

Public Services and Utilities

Public services impacts are generally related to increased population. The Modified 2004 RTP includes the same increase in population as the Plan, and therefore, the need for public facilities and solid waste services would be similar to the Plan Alternative. The potential to sever underground utility lines would also be similar, as both alternatives contemplate similar transportation networks. .

The population distribution of the Modified 2004 RTP Alternative would not be as compact as the Plan Alternative due to the absence of land use-transportation strategies. The cumulative impact of the congestion that results because of the population distribution would result in emergency vehicle response times that are worse than the Plan Alternative.

The cumulative impact of new development to accommodate the additional population would generate approximately the same need for additional emergency personnel, schools, and solid waste services and would result in approximately the same chance of severing underground utility lines for the Modified 2004 RTP Alternative as for the Plan Alternative.

Security and Emergency Preparedness

The Modified 2004 RTP Alternative would result in slightly more than or equal risk for wildfire and/or mudslide destruction, compared to the Plan Alternative. The Modified 2004 RTP Alternative is projected to result in approximately 61,000 additional urbanized acres compared to the Plan Alternative. The Modified 2004 RTP Alternative thus would have a greater cumulative effect than the Plan Alternative in inducing growth in areas with high threats of wild fires.

Under all the alternatives, policies and procedures at the local, State and federal level are in place regarding emergency procedures. These should not be impacted by any of the transportation plan alternatives.

Transportation

The Modified 2004 RTP Alternative would result in similar impacts to transportation resources, compared to the 2008 RTP. The 2004 RTP includes a very similar project list to the 2008 RTP, with a few variations such as the High Desert Corridor, which is not in the 2004 RTP. Impacts on the transportation system would be similar to the 2008 RTP.

Water Resources

The transportation investments for the Modified 2004 RTP Alternative are generally similar to those in the 2008 RTP. Both would result in the construction of a similar number of projects, resulting in roughly equivalent changes to road runoff and drainage patterns. Impacts 3.15-2 and 3.15-3 would also be expected to be the same as the Plan.

The Modified 2004 RTP Alternative's cumulative impacts to water quality, groundwater recharge and flood hazards due to urban development patterns would be expected to be greater than those of the 2008 RTP. The alternative would accommodate similar population, households, and employment to the 2008 RTP, but as noted above, the growth distribution associated with the Modified 2004 RTP Alternative would be expected to consume more land and would not focus growth in urbanized areas compared to the Plan.

The cumulative impacts on wastewater service capacity, due to the growth expected between the base year and 2035, would be approximately the same in the Modified 2004 RTP Alternative and the Plan. The total population in each county is relatively constant between the Modified 2004 RTP Alternative and the Plan, such that Imperial, Los Angeles, Riverside and San Bernardino counties would be at or above the existing capacity for wastewater treatment. Though it is expected that services would be added as they are needed, the Modified 2004 RTP Alternative would result in similar impacts to Plan.

The *existing* water supply and infrastructure would not be able to support the population in the Modified 2004 RTP Alternative in 2035. Implementation of the mitigation measures associated with Impact 3.15-8 may provide future supply, but the *existing* supply still falls short of future demand. This would be similar to the Plan impacts.

Envision Alternative

The development of the 2008 RTP proceeded via an integrated process including incorporation of regional growth visioning concepts contained within the Compass Blueprint. Full implementation of Compass concepts as well as additional sustainability planning resulted in an alternative to the 2008 RTP that is referred to herein as Envision.

The Envision Alternative includes transportation and land use strategies that encourage a substantial portion of future growth to concentrate in existing urban centers through infill and redevelopment. This alternative was designed to increase efficiency of the transit system, reduce vehicle trips and VMT, and reduce consumption of open space and habitat compared to the RTP. The Envision Alternative includes the same transportation network as the Plan, but has significantly more infill development and more aggressive growth strategies resulting in less consumption of vacant land compared to the Plan.

Aesthetics and Views

The Envision Alternative would have less effect on aesthetics and views than the Plan Alternative. Envision focuses development in urban areas, and reduces regional sprawl. However, the Envision Alternative includes the same projects as the Plan alternative and therefore would include similar impacts from transportation projects. Envision would have the same impact as the Plan Alternative on State Scenic Highways and vista points.

For cumulative impacts, Envision would have more emphasis on infill development than the Plan Alternative. The more compact development would create fewer contrasts with the overall visual character of the existing landscape setting.

Air Quality

Region-wide criteria pollutant emissions under the Envision Alternative would be less than the criteria pollutant emissions under the 2008 RTP.

Table 4.4 compares emissions under the Envision Alternative with Plan emissions. When compared to the current condition emissions, the Envision Alternative would result in similar, but slightly reduced emissions compared to the Plan.

As with the Plan, PM_{10} emissions from heavy-duty trucks would be expected to decrease from 2008 levels for each county. As a result of the anticipated decline in TAC emissions, as with the Plan the Envision Alternative would have a less than significant impact with respect to regional TAC emissions.

As with the Plan, the Envision Alternative would be expected to generate a significant amount of construction activity and therefore exceed the significance thresholds established in the CEQA Guidelines. This would create a significant short-term impact. 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.

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 Envision would be similar to, and slightly less than the 2008 RTP. The 2008 RTP conforms with the local air quality management Plans and cumulative impacts are less than significant. Therefore, Envision emissions would also conform to the local air quality management plans and have a less than significant cumulative impact with respect to consistency with applicable plans. As with the Plan, the increase in emissions would still be significant.

As shown in **Table 4.5**, the Envision Alternative would result in a net increase in Greenhouse Gases of 23.16 tonnes per year in 2020 and 50 tonnes per year in 2035, compared to increases of 24.31 tonnes per year in 2020 and 51.41 tonnes per year in 2035. The Envision Alternative

would have nearly 5 percent fewer Greenhouse Gas emissions in 2020 and nearly 3 percent fewer emissions in 2035 compared to the Plan Alternative. Nonetheless, given the increase in greenhouse gas emissions in 2020 and 2035, the Envision Alternative would result in a significant impact.

Biological Resources

Because the transportation network is the same for both alternatives, the Envision Alternative's direct impacts to biological resources would be the same as those of the 2008 RTP. The impacts to natural vegetation, sensitive species and communities, habitat connectivity, near-road human disturbances, disturbances associated with construction generated smoke, light and noise; potential displacement of riparian and wetland areas, and siltation of water bodies would and construction impacts would also be the same.

The Envision Alternative's cumulative impacts to biological resources due to urban development patterns would be expected to be less than those of the 2008 RTP. The Envision Alternative would accommodate similar growth in population, but this alternative includes transportation and land use strategies that encourage a substantial portion of future growth to concentrate in existing urban centers through infill and redevelopment, more so than the 2008 RTP. These measures would discourage population and employment centers from growing in the outlying areas of the region where consumption of open land (and potentially biological resources) would occur. The Envision Alternative cumulative impacts would be less than the Plan.

Cultural Resources

Both the Envision Alternative and the Plan have the same transportation network, therefore, direct impacts to cultural resources would be similar to those of the 2008 RTP. The impacts to historical, archaeological, and paleontological resources and human remains from the transportation network would also be similar.

However, the Envision Alternative's cumulative impacts due to urban development patterns would be expected to be less than those of the 2008 RTP. This alternative would accommodate similar population, households, and employment to the 2008 RTP, but includes transportation and land use strategies that encourage a substantial portion of future growth to concentrate in existing urban centers through infill and redevelopment, more so than the 2008 RTP. These measures would discourage population and employment centers from growing in the outlying areas of the region where consumption of open vacant land would occur. The Envision Alternative would be consume fewer vacant acres overall and therefore have a lower potential for disturbing previously undiscovered cultural resources than the 2008 RTP. The Envision alternative's cumulative impacts would be lesser than the Plan.

TABLE 4.4

CRITERIA POLLUTANT EMISSIONS BY COUNTY – ENVISION VS 2035 PLAN (IN TONS PER DAY)

County		ROG Summer	ROG Annual	NOx Summer	NOx Annual	NOx Winter	CO Winter	PM10 Annual	PM2.5 Annual	SOx Annual
Los Angeles	*Envision*	40	40	59	60	63	308	71	11	1
	Plan	40	40	59	60	63	310	71	11	1
	Difference	0	0	0	0	0	-2	0	0	0
	% Difference	0%	0%	0%	0%	0%	**-1%**	0%	0%	0%
Imperial	*Envision*	4	3	8	8	8	27			0
	Plan	4	3	8	8	8	28			0
	Difference	0	0	0	0	0	-1			0
	% Difference	0%	0%	0%	0%	0%	**-4%**			0%
Orange	*Envision*	15	15	18	18	19	107	26	4	0
	Plan	15	15	18	18	19	107	26	4	0
	Difference	0	0	0	0	0	0	0	0	0
	% Difference	0%	0%	0%	0%	0%	0%	0%	0%	0%
Riverside	*Envision*	11	10	17	17	18	76	23	4	0
	Plan	11	10	17	17	18	77	24	4	0
	Difference	0	0	0	0	0	-1	-1	0	0
	% Difference	0%	0%	0%	0%	0%	**-1%**	**-4%**	0%	0%
San Bernardino (SCAB and MDAB Portion)	*Envision*	10	9	18	19	19	68	14	2	0
	Plan	10	9	19	19	19	69	14	2	0
	Difference	0	0	-1	0	0	-1	0	0	0
	% Difference	0%	0%	**-5%**	0%	0%	**-1%**	0	0	0
Ventura	*Envision*	4	4	5	5	5	30			0
	Plan	4	4	5	5	5	30			0
	Difference	0	0	0	0	0	0			0
	% Difference	0%	0%	0%	0%	0%	0%			0%

TABLE 4.5
ENVISION ALTERNATIVE GREENHOUSE GAS EMISSIONS [1]

Area and Source	Carbon Equivalent (Million Metric Tonnes per Year) [2]				
	Existing (2008)	Future No Project (2020)	Envision Alternative (2020)	Future No Project (2035)	Envision Alternative (2035)
Imperial County					
Construction	0.04	0.04	0.04	0.04	0.04
Mobile	1.36	1.90	1.84	2.45	2.33
Electricity	0.59	0.93	0.91	1.17	1.16
Natural Gas	0.37	0.59	0.57	0.74	0.73
Total	2.36	3.46	3.36	4.40	4.26
Los Angeles County					
Construction	0.66	0.65	0.73	0.66	0.73
Mobile	42.28	46.05	44.87	51.19	49.00
Electricity	25.88	27.79	27.99	29.73	30.12
Natural Gas	24.38	26.25	26.39	28.11	28.50
Total	93.20	100.74	99.98	109.69	108.35
Orange County					
Construction	0.10	0.10	0.13	0.10	0.13
Mobile	13.20	14.50	14.20	15.80	15.59
Electricity	7.72	8.50	8.46	8.84	9.01
Natural Gas	8.65	9.55	9.50	9.93	10.11
Total	29.67	32.65	32.29	34.67	34.84
Riverside County					
Construction	0.46	0.46	0.40	0.46	0.40
Mobile	10.49	13.38	13.05	18.10	16.27
Electricity	5.15	7.17	7.09	9.54	9.14
Natural Gas	4.31	6.02	5.96	8.03	7.70
Total	20.41	27.03	26.50	36.13	33.51
San Bernardino County					
Construction	0.33	0.33	0.27	0.33	0.28
Mobile	13.13	16.85	16.26	22.68	20.32
Electricity	5.84	7.40	7.40	9.44	9.08
Natural Gas	4.29	5.44	5.44	6.94	6.67
Total	23.59	30.02	29.37	39.39	36.35
Ventura County					
Construction	0.09	0.09	0.10	0.05	0.06
Mobile	3.37	3.75	3.67	4.26	4.19
Electricity	2.13	2.44	2.43	2.69	2.73
Natural Gas	1.97	2.26	2.25	2.49	2.53
Total	7.56	8.54	8.45	9.49	9.51
Total Emissions	176.79	202.44	199.95	233.77	226.82
Envision Alternative Compared to No Project (2020 and 2035)		(2.49)		(6.95)	
Envision Alternative Compared to Existing		23.16		50.03	

NOTES:
1. The table does not include all sources of GHG emissions (e.g., industrial processes, agriculture, etc.).
2. Please refer to **Appendix B** for a complete description of the methodology used to obtain GHG emissions.

Energy

Impact 3.5-1, which relates to the use of non-renewable energy resources in construction and expansion of the regional transportation system, would be similar under the Envision Alternative than for the 2008 RTP, since both the Plan and the Envision alternative include the same transportation investments.

Impact 3.5-2 relates to the use of non-renewable energy resources in the operation of the regional transportation system. Transportation energy usage would be lower under the Envision Alternative compared with the 2008 RTP Alternative due to the further incorporation of regional growth visioning concepts contained within Southern California Compass as well as sustainability planning. Specifically, the Envision Alternative would consume approximately 32,690 thousand gallons of transportation fuel per day and the Plan Alternative would consume approximately 32,940 thousand gallons per day. In addition, the Envision Alternative would consume slightly less electricity and natural gas than the Plan Alternative. However, the magnitude of this impact under the Envision Alternative would be similarly significant even after mitigation.

Impact 3.5-3 relates to the greenhouse gas reduction levels identified in AB 32 (1990 levels by 2020) and the California Climate Action Team Report. Transportation fuel use, the main contributor to greenhouse gas emissions in California, is expected to be lower under the Envision Alternative when compared to the 2008 RTP due to transportation and land use strategies that encourage a substantial portion of future growth to concentrate in existing urban centers through infill and redevelopment. Nonetheless, the Envision Alternative would not alone meet the greenhouse gas reduction requirements set forth in AB 32. Therefore, the Envision Alternative would still not meet the greenhouse gas emission levels required in AB 32, or fully address the strategies identified in the California Climate Action Team Report, resulting in a significant impact with mitigation, similar to the Plan Alternative.

Cumulative Impact 3.5-4 is a significant impact relating to the overall growth in the use of non-renewable energy resources for the SCAG region. As mentioned above, transportation energy consumption under the Envision Alternative would be lower compared to the Plan Alternative. Further, the analysis of residential energy consumption indicates that the Envision Alternative would consume slightly less energy due to a distribution that includes more infill development and slightly more reliance on energy-efficient multi-family dwellings in inland areas versus the Plan Alternative. Overall, the magnitude of this impact under the Envision Alternative would be less than for the 2008 RTP Alternative, but it would still be cumulatively considerable and therefore significant.

Geology, Soils, and Seismicity

The Envision Alternative's direct impacts to geological resources would be similar to those of the 2008 RTP and remain significant because the transportation network is the same for both plans. However, the Envision Alternative has a considerably lower acreage of impacted land and was designed to reduce consumption of open space and habitat. As a consequence of "smart growth"

measures, and because the Alternative concentrates development in areas of existing areas geologically unstable areas would be avoided. As a result, fewer people and structures would be exposed to risks of injury from geological hazards. Although under both the Envison Alternative and the Plan, the same total number of people would be exposed to geologic hazards. The Envision Alternative would also consume less land and, therefore, cumulatively considerable impacts on geological resources would be reduced compared to the 2008 RTP.

Hazardous Materials

The Envision Alternative seeks transportation and land use strategies that encourage infill and redevelopment, therefore, transportation of hazardous materials would also be slightly less, with fewer risks, than for the Plan Alternative. Thus Impact 3.7-1**,** which involves the routine transport, use, or disposal of hazardous materials and Impact 3.7-2 which relates to the risk of upset of hazardous materials, would be slightly less under Envision than under the Plan, though it would still be significant.

Impact 3.7-3 relates to the risk of release of hazardous materials within one-quarter mile of a school. Because the Envision Alternative would have the same transportation investments, with possible denser development, this impact would be similar to the Plan.

Both the Envision Alternative and the 2008 RTP include the same transportation projects, however, the Envision alternative includes growth strategies that focus development in urban areas, which are more likely to include contaminated sites. As a result, Impact 3.7-4, which relates to the risk of disturbing contaminated sites during construction, would be greater for the Envision Alternative than for the 2008 RTP. This impact would still be less-than-significant with mitigation.

Cumulative Impact 3.7-5, which relates to hazardous materials transportation impacts on neighboring counties, would be less for the Envision Alternative than for the 2008 RTP, since mobility improves under the Envision Alternative, including that of heavy-duty trucks, putting less traffic pressure on neighboring counties. This impact would still be significant.

Cumulative Impact 3.7-6, which relates to the risk of disturbing contaminated sites during construction related to the region's growth as a whole, would be expected to be increased under the Envision Alternative since the Alternative would encourage even more infill and redevelopment than the 2008 RTP Alternative. However, this impact would still be less than significant with mitigation.

Land Use

Current land use practices would have to be changed to accommodate the Envision Alternative because the Envision Alternative focuses considerable growth onto the existing urban area around transit station, and existing centers. It does not allow further use of land for single-family development. To achieve the densities of the Envision Alternative, there would be a greater

chance of conflicting with general plans in the Envision Alternative than in the Plan Alternative. Because of this, the Envision Alternative would have greater impacts than the Plan.

Noise

The Envision Alternative includes the same transportation investments as the Plan. As a result, the Envision Alternative would have similar noise impacts as the 2008 RTP. For the same reason Impact 3.9-2, relating to the impact of noise-sensitive land uses directly adjacent to transportation facilities, would be the same with the Envision Alternative as the 2008 RTP.

Even though there are differences in the transportation projects, the number of sensitive receptors that would be impacted by noise under the Envision Alternative would be similar to the 2008 RTP. Therefore, there is no change to Impact 3.9-3.

Cumulative and ambient noise would increase in parts of the region where the growth is focused (urban centers, etc), but would be lesser than the Plan in rural areas that would not receive additional growth. Cumulative impacts would be generally similar compared to the 2008 RTP.

Open Space

The Envision Alternative's transportation network would have a lesser potential effect on agricultural lands and open space. New development to accommodate the additional population would consume fewer acres than the proposed Plan. Under the Envision Alternative approximately 111,000 acres would be urbanized compared to 250,000 under the Plan, including 22,790 acres of agriculture, 6,839 acres of open space and 81,640 acres of vacant land compared to 47,000 of agriculture, 11,104 acres of open space and 146,315 acres of vacant land under the Plan. This reduction in the amount of urbanized acres would result in a lesser cumulative effect than the Plan Alternative on agriculture and open space. In addition the Envision contribution to cumulatively considerable impacts to vacant land would be lesser.

Population, Employment and Housing

The Envision 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 Alternative would focus development in urban areas and existing communities and would have a greater emphasis on infill development. As a result, the Envision Alternative could result in an increase in the number of homes or businesses that are displaced.

Public Services and Utilities

Under the Envision Alternative, the need for police and fire/emergency services and solid waste services would be less than the Plan Alternative because the Envision Alternative focuses

development in urban areas where services currently exist. The potential to sever underground utility lines also would be less than the Plan Alternative.

The cumulative impact of new development to accommodate the additional population would generate approximately the same need for additional emergency personnel, schools, and solid waste services and would result in a similar chance of severing underground utility lines for the Envision Alternative as for the Plan Alternative. In addition, the emergency vehicle response times that results because of the growth distribution of the Envision Alternative would be similar to the Plan Alternative.

Security and Emergency Preparedness

The Envision Alternative would result in less risk for wildfire and/or mudslide destruction, compared to the Plan Alternative. The Envision Alternative is projected to result in approximately 111,000 additional urbanized acres, a little more than half of the Plan Alternative. The Envision Alternative thus would have a lesser cumulative effect than the Plan Alternative in inducing growth in areas with high threats of wild fires.

Under all the alternatives, policies and procedures at the local, State and federal level are in place regarding emergency procedures. These should not be impacted by any of the transportation plan alternatives.

Transportation

The Envision Alternative would result in less transportation impacts than the 2008 RTP. The Envision Alternative would result in 543 million daily VMT, less than the 2008 RTP's 552 million daily VMT, and the VMT in the base year, making it a beneficial impact. Daily hours of delay under the Envision Alternative would be 2.9 million person-hours for all vehicles and 0.404 million vehicle-hours for heavy-duty trucks. Comparatively, the 2008 RTP would produce 6.6 million person-hours of delay for all vehicles and 0.467 million vehicle-hours of delay for heavy-duty trucks.

The Envision Alternative would result in a greater percentage of work opportunities within 45 minutes travel time than the 2008 RTP. 80 percent of work trips could be made within 45 minutes by auto and by transit with the Envision Alternative, compared to 80 percent within 45 minutes by auto and 44% by transit with implementation of the 2008 RTP.

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, VHT, and heavy-duty truck VHT data reported for the Envision Alternative above. The Envision Alternative would have less cumulative impacts than the 2008 RTP.

Water Resources

The Envision alternative includes the same transportation network as the Plan. Therefore, the direct impacts due to increased road runoff and drainage patterns would be the same as the Plan. Direct impacts to groundwater infiltration and increased flooding hazards, due to increased impervious surfaces of roads, would also be the same as the Plan (Impacts 3.15-2 and 3.15-3).

The Envision Alternative's cumulative water quality, groundwater recharge, and flood hazard impacts due to urban development patterns would be expected to be less than those of the 2008 RTP. The Envision Alternative would accommodate similar growth in population, but this Alternative includes further transportation and land use strategies that encourage a substantial portion of future growth to concentrate in existing urban centers through infill and redevelopment, to a greater extent than the 2008 RTP. The Envision Alternative also includes the same number of jobs and households as the Plan, but consumes roughly half as much land as the 2008 RTP.

The cumulative impacts on wastewater service capacity, due to the growth expected between the base year and 2035, would regionally be approximately the same in the Envision Alternative and the Plan. The total population in each county differs between the Envision Alternative and the Plan. Four counties are at or above their treatment capacity in the Envision Alternative, as for the Plan, but the impacts are distributed to different counties. In the Envision Alternative, Los Angeles County's wastewater treatment capacity would not be exceeded (as it is under the Plan scenario), and the impacts to Riverside and San Bernardino counties would be greater than under the Plan. Ventura would exceed its wastewater treatment capacity in the Envision scenario (though not in the Plan), and Imperial County would exceed its capacity as it would in the Plan. Though it is expected that services would be added as they are needed, for the purpose of determining significance of the impact, the future wastewater flow must be compared to the existing treatment capacity, and the impact of the Envision Alternative is significant and of similar regional magnitude as the Plan, though the impacts are distributed differently.

The Envision Alternative would distribute less growth within the MWD service area, and more to other water supply agencies than the Plan (see Table 3.15-6). These water agencies are smaller, and most occur in drier inland climates. Relative to the Plan Alternative, these factors would provide additional challenges in supplying municipal water to meet the demand associated with the Envision Alternative. The *existing* water supply and infrastructure would not be able to support the population in the Envision Alternative in 2035. Implementation of the mitigation measures associated with Impact 3.15-8 may provide future supply, but the *existing* supply still falls short of future demand. The impact would remain significant and greater in magnitude than for the Plan Alternative.

The Environmentally Superior Alternative

With less impact on vacant, open space/recreation and agricultural land and fewer and less severe impacts than the other Alternatives, the Envision Alternative, as fully analyzed above would be the environmentally superior alternative.

Impact	2008 RTP	No Project	2004 Modified RTP	Envision
3.1 AESTHETICS				
Impact 3.1-1: Construction and implementation of individual 2008 RTP projects could obstruct views of scenic resources or scenic vistas.	Significant	S-	S=	S=
Impact 3.1-2: Construction and implementation of projects in the RTP could potentially alter the appearance of scenic resources along or near designated scenic highways and vista points.	Significant	S-	S=	S=
Impact 3.1-3: Construction and implementation of projects included in the 2008 RTP could 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.	Significant	S-	S=	S-
Cumulative Impact 3.1-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP influences the pattern of this urbanization, by increasing mobility and including land-use-transportation measures. At the regional scale, the 2008 RTP's contribution to impacts on the overall visual character of the existing landscape setting would be cumulatively considerable.	Significant	S+	S+	S-
3.2 AIR QUALITY				
Impact 3.2-1: Under the Plan, long-term emissions of PM10 and PM2.5 would increase substantially, when compared to existing conditions (2008). PM10 would increase in the SCAB, San Bernardino portion of MDAB and Imperial County portion of SSAB, and PM2.5 emissions would increase in the SCAB; PM10 would increase in Los Angeles, Orange, Riverside and San Bernardino Counties, PM2.5 would increase in Los Angeles and Riverside Counties, as a result of on-road mobile sources. The increase in regional emissions of PM10 and PM2.5 would be considered a significant cumulative impact. Emissions of ROG, NOX, CO, and SOx would decrease when compared to 2008; this would be a beneficial impact.	Significant for PM10 and PM 2.5	S+	S=	S-
Impact 3.2-2: Long-term (operational) localized impacts resulting from freeway operations under the Plan would be reduced compared to today but would likely continue to exceed the locally acceptable cancer risk of one in one million. The cumulative impact is beneficial. The continuation of a pre-existing problem is not an impact of the	Less than significant	LTS	LTS	LTS

Impact	2008 RTP	No Project	2004 Modified RTP	Envision
plan or cumulative development.				
Impact 3.2-3: Emissions of criteria pollutants would increase under the plan as a result of construction of Plan projects and associated development in the region.	Significant	S-	S=	S=
Cumulative Impact 3.2-4: Cumulative development would result in on-road emissions discussed in previous impacts as well as train, airplane, ship and stationary and area sources of emissions. All emissions are anticipated to be consistent with applicable AQMPs and SIPs and within regional conformity emission budgets.	Less than Significant	LTS	LTS	LTS
Nonetheless, such increases in emissions would be significant.	Significant	S=	S=	S=
Cumulative Impact 3.2-5: The 2008 RTP would result in increased trips and VMT as well as increased growth in the region compared to today, resulting in increases in Greenhouse Gas (GHG) emissions.	Significant	S+	S=	S-
3.3 <u>BIOLOGICAL RESOURCES</u>				
Impact 3.3-1: Transportation projects included in the 2008 RTP on previously undisturbed land could displace natural vegetation, and thus habitat, some of which is utilized by sensitive species in the SCAG region.	Significant	S-	S-	S=
Impact 3.3-2: The 2008 RTP would potentially contribute to the fragmentation of existing habitat, decreasing habitat patch sizes, reducing habitat connectivity, and causing direct injury to wildlife. The 2008 RTP includes new transportation corridors that may form barriers to animal migration or foraging routes.	Significant	S-	S=	S=
Impact 3.3-3: The 2008 RTP includes new transportation facilities that could increase near-road human disturbances such as litter, trampling, light pollution and road noise in previously relatively inaccessible and undisturbed natural areas.	Significant	S-	S=	S=
Impact 3.3-4: The 2008 RTP projects would potentially damage natural vegetation and other habitat components as a result of trampling or off-road machinery during the construction phases for these projects. Direct fatalities to wildlife would also potentially occur.	Less than Significant	LTS	LTS	LTS
Impact 3.3-5: The 2008 RTP projects would potentially create noise, smoke, lights and/or other disturbances to biological resources during construction	Significant	S-	S=	S=

Impact	2008 RTP	No Project	2004 Modified RTP	Envision
phases for these projects.				
Impact 3.3-6: The 2008 RTP includes projects that would potentially displace riparian or wetland habitat.	Significant.	S-	S=	S=
Impact 3.3-7: The 2008 RTP would potentially increase siltation of streams and other water resources from exposures of erodible soils during construction activities.	Significant	S-	S=	S=
Impact 3.3-8: Implementation of the 2008 RTP would not conflict with any provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan (NCCP).	Less than Significant	LTS	LTS	LTS
Cumulative Impacts 3.3-9: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization.	Significant	S+	S+	S-
3.4 <u>CULTURAL RESOURCES</u>				
Impact 3.4-1: Construction of projects from the 2008 RTP could cause a substantial adverse change in the significance of a historical resource.	Significant	S-	S=	S=
Impact 3.4-2: Construction of projects from the 2008 RTP could cause a substantial adverse change in the significance of an archaeological resource.	Significant	S-	S=	S=
Impact 3.4-3: Construction of projects from the 2008 RTP could directly or indirectly destroy unique paleontological resources or sites or unique geological features.	Significant	S-	S=	S=
Impact 3.4-4: Construction of projects from the 2008 RTP could disturb human remains, including those interred outside of formal cemeteries.	Significant	S-	S=	S=
Cumulative Impacts 3.4-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional impacts to existing historic resources and previously undisturbed and undiscovered cultural resources, as described in Impacts 3.4-1 through 3.4-4 above. This impact would be cumulatively considerable.	Significant	S+	S+	S-
3.5 <u>ENERGY</u>				
Impact 3.5-1: The implementation of the 2008 RTP is likely to use electricity, natural gas, gasoline, diesel, and other non-renewable energy types in the	Significant	S-	S=	S-

Impact	2008 RTP	No Project	2004 Modified RTP	Envision
construction and expansion of the regional transportation system and development in the region between the current conditions and 2035.				
Impact 3.5-2: The implementation of the 2008 RTP is likely to substantially increase the consumption of electricity, natural gas, gasoline, diesel, and other non-renewable energy in the operation of the transportation system and operation of associated growth in the region between the current conditions and 2035.	Significant	S-	S=	S-
Impact 3.5-3: Implementation of the 2008 RTP has the potential to not fully address the greenhouse gas reduction levels identified in AB 32 (1990 levels by 2020).	Significant	S=	S-	S-
Cumulative Impact 3.5-4: Implementation of the investments and policies in the 2008 RTP would contribute to a cumulatively considerable increase in the amount of total energy consumed in the SCAG region between 2008 and 2035.	Significant	S=	S=	S-
3.6 GEOLOGY, SOILS AND SEISMICITY				
Impact 3.6-1: Implementation of the 2008 RTP could expose people or structures to potential substantial adverse effects, risk of surface rupture, ground shaking, liquefaction and landsliding or seismically-induced ground shaking or seiche waves.	Significant	S-	S=	S=
Impact 3.6-2: Significant earthwork associated with implementation of the 2008 RTP could result in substantial soil erosion and/or the loss of topsoil in some cases potentially resulting in slope failure.	Significant	S-	S=	S=
Impact 3.6-3: Projects included in the 2008 RTP could be located on expansive soils, a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.	Significant	S-	S=	S=
Cumulative Impact 3.6-4: Urbanization in the SCAG region would increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. Implementation of the 2008 RTP would have the potential to result in a cumulatively considerable adverse effect on human beings and property when considered at the regional scale.	Significant	S=	S=	S-

Impact	2008 RTP	No Project	2004 Modified RTP	Envision
3.7 HAZARDOUS MATERIALS				
Impact 3.7-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	Less than Significant	LTS	LTS	LTS
Impact 3.7-2: The implementation of the 2008 RTP could 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.	Significant	S-	S+	S=
Impact 3.7-3: The implementation of the 2008 RTP could create a hazard to the public or the environment by emitting hazardous materials within one-quarter mile of a school.	Significant	S-	S=	S=
Impact 3.7-4: The implementation of the 2008 RTP could 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.	Less than significant	LTS	LTS	LTS
Cumulative Impact 3.7-5: The 2008 RTP would contribute a cumulatively significant amount of hazardous material transportation impacts to areas outside of the SCAG region.	Significant	S+	S+	S-
Cumulative Impact 3.7-6: Implementation of the investments and policies in the 2008 RTP could create a potential hazard to the public or the environment by the disturbance of contaminated sites as a result of population and housing growth in the region.	Less than Significant	LTS	LTS	LTS
3.8 LAND USE				
Impact 3.8-1: The proposed 2008 RTP contains transportation projects and strategies to distribute the future growth in the region. These projects and strategies could result in inconsistencies with currently applicable adopted local land use plans and policies.	Significant	S-	S=	S+
Impact 3.8-2: The 2008 RTP contains transportation projects that have the potential to disrupt or divide established communities.	Significant	S-	S=	S+
Cumulative Impact 3.8-3: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to land use and would change the	Significant	S-	S+	S+

Impact	2008 RTP	No Project	2004 Modified RTP	Envision
intensity of land use in some areas.				
3.9 NOISE				
Impact 3.9-1: Grading and construction activities associated with the proposed freeway, arterial, transit and HSRT projects identified in the 2008 RTP would intermittently and temporarily generate noise levels above ambient background levels. Noise levels in the immediate vicinity of the construction sites would increase substantially sometimes for extended duration.	Significant	S-	S=	S=
Impact 3.9-2: Noise-sensitive land uses could be exposed to noise in excess of normally acceptable noise levels and/or could experience substantial increases in noise 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 transit facilities as well as increased use of existing transit facilities, etc.).	Significant	S-	S=	S=
Cumulative Impact 3.9-3: Cumulative ambient noise levels could increase in urban areas of the region to exceed normally acceptable noise levels or have substantial increases in noise 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 facilities as well as increased use of existing transit facilities, etc.).	Significant	S-	S=	S=
3.10 OPEN SPACE				
Impact 3.10-1: Implementation of the proposed 2008 RTP could result in substantial disturbance and/or loss of prime farmlands and/or grazing lands, throughout the six-county SCAG region.	Significant	S-	S=	S=
Impact 3.10-2: Implementation of the projects included in the 2008 RTP would result in a substantial loss or disturbance of existing open space and recreation lands.	Significant	S+	S+	S-
Impact 3.10-3: Implementation of the 2008 RTP could increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facilities would occur; or could result in a decrease in performance objectives for existing parks.	Significant	S+	S+	S-
Cumulative Impact 3.10-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and	Significant	S+	S+	S-

Impact	2008 RTP	No Project	2004 Modified RTP	Envision
including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth patterns contributes to regional cumulatively considerable impacts to open space and result in a loss of open space and agricultural lands in the region.				
3.11 POPULATION, HOUSING AND EMPLOYMENT				
Impact 3.11-1: Implementation of the 2008 RTP could facilitate substantial population growth to some areas of the region.	Significant	S-	S=	S=
Impact 3.11-2: Implementation of the 2008 RTP projects could require the acquisition of rights-of-way that could displace a substantial number of existing homes and businesses.	Significant	S-	S=	S+
Cumulative Impact 3.11-3: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to currently vacant natural land.	Significant	S-	S+	S+
3.12 PUBLIC SERVICES AND UTILITIES				
Impact 3.12-1: Construction and implementation of the 2008 RTP would affect the level of transportation-related public services facilities, such as police and fire/emergency personnel and associated stations or other public facilities in the SCAG region.	Less than Significant	LTS	LTS	LTS
Impact 3.12-2: Construction necessary to implement the 2008 RTP may uncover and potentially sever underground utility lines (electric and natural gas).	Less than Significant	LTS	LTS	LTS
Impact 3.12-3: Construction necessary to implement the 2008 RTP would affect the demand for solid waste services in the SCAG region.	Less than Significant	LTS	LTS	LTS
Cumulative Impact 3.12-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to the response times of police and fire and emergency services in the SCAG region.	Less than Significant	LTS	LTS	LTS

Impact	2008 RTP	No Project	2004 Modified RTP	Envision
Cumulative Impact 3.12-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to the staffing level of police and fire and emergency services in the SCAG region.	Significant	S=	S=	S=
Cumulative Impact 3.12-6: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to the number of school-age children and the demand for school facilities in different parts of the SCAG region.	Significant	S=	S=	S=
Cumulative Impact 3.12-7: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence would create a cumulatively considerable impact to the demand for solid waste services in the SCAG region.	Significant	S=	S=	S=
3.13 <u>SECURITY AND EMERGENCY PREPAREDNESS</u>				
Impact 3.13-1: Implementation of the 2008 RTP could impair transportation safety, security, and reliability for people and goods in the region.	Significant	S+	S=	S=
Impact 3.13-2: The RTP has the potential to inhibit the prevention, protection, response to, and recovery from major human-caused or natural events that could create a significant hazard to the public threatening and impacting lives, property, the transportation network and the regional economy.	Significant	S+	S=	S=
Impact 3.13-3: Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	Less than Significant	LTS	LTS	LTS
Cumulative Impact 3.13-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation	Significant	S+	S+	S-

Impact	2008 RTP	No Project	2004 Modified RTP	Envision
measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable fire threat to development in the SCAG region.				
3.14 TRANSPORTATION				
Impact 3.14-1: In 2035 there would be substantially more total daily Vehicle Miles of Travel (VMT) than the current daily VMT. Implementation of the 2008 RTP would contribute to this increase.	Significant	S+	S=	S=
Impact 3.14-2: In 2035 there would be substantially higher average Vehicle Hours Traveled (VHT) in delay than the current condition. Implementation of the 2008 RTP would contribute to this increase.	Significant	S+	S=	S=
Impact 3.14-3: In 2035 there would be substantially greater average daily VHT in delay for heavy-duty truck trips than the current condition. Implementation of the 2008 RTP would contribute to this increase.	Significant	S+	S=	S=
Impact 3.14-4: Implementation of the 2008 RTP would contribute to an increase in the percent of work opportunities within 45 minutes travel time by personal vehicle or by transit in 2035, relative to the existing condition.	Beneficial	B	B	B
Impact 3.14-5: Implementation of the 2008 RTP would contribute to a lower system-wide fatality accident rate for all travel modes in 2035 compared to the existing condition.	No Impact	N	N	N
Impact 3.14-6: Implementation of the 2008 RTP would contribute to a lower system-wide injury accident rate for all travel modes in 2035 compared to the existing condition.	Beneficial	N	B	B
Cumulative Impact 3.14-7: Implementation of the 2008 RTP would contribute to a cumulatively considerable amount of transportation impacts, such as VMT and all-vehicle VHT in delay, to counties outside of the SCAG region.	Significant	S+	S=	S=
3.15 WATER RESOURCES				
Impact 3.15-1: Local surface water quality could be degraded by increased roadway runoff created by RTP projects, potentially violating water quality standards associated with wastewater and stormwater permits. RTP projects could alter the existing drainage patterns in ways that would result in substantial erosion or siltation.	Significant	S-	S=	S=
Impact 3.15-2: Increased impervious surfaces due to transportation projects would reduce groundwater infiltration.	Significant	S-	S=	S=

Impact	2008 RTP	No Project	2004 Modified RTP	Envision
Impact 3.15-3: The 2008 RTP could increase flooding hazards, by placing transportation investments, on alluvial fans and within 100-year flood hazard areas.	Less than Significant	LTS	LTS	LTS
Cumulative Impact 3.15-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in impacts to water quality.	Significant	S+	S+	S-
Cumulative Impact 3.15-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in impacts to stormwater infiltration and groundwater recharge.	Significant	S+	S+	S-
Cumulative Impact 3.15-6: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in flooding hazard impacts.	Significant	S+	S+	S-
Cumulative Impact 3.15-7: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the need for increased wastewater treatment capacity in the region by 2035. The proposed Plan influences population growth, resulting in an indirect and cumulative impact on wastewater treatment services.	Significant	S=	S=	S+
Cumulative Impact 3.15-8: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to an increased demand for water supply and its associated infrastructure. Water	Significant	S=	S=	S=

Impact	2008 RTP	No Project	2004 Modified RTP	Envision
agencies in the SCAG region produce many long-range planning studies to provide a system adequate to supply water demand, however the *existing* water supplies and infrastructure would not be sufficient to meet the expected demand in 2035.				

CHAPTER 5
Long Term Effects

Long term effects of a project or plan include the significant and unavoidable impacts identified for each resource, any irreversible effects, cumulative impacts and/or growth-inducing impacts. Each of these types of long term effects for the 2008 RTP are listed below. Additional information on these impacts is available in the appropriate resource section in Chapter 3.0.

Significant and Unavoidable Environmental Changes

The environmental effects listed below are those that cannot be avoided if the 2008 RTP is implemented. They include impacts that can be mitigated but not reduced to a level of insignificance. The economic, social, technological or other benefits of the 2008 RTP will be considered when balancing these impacts in the Statement of Overriding Considerations.

Impact 3.1-1: Construction and implementation of individual 2008 RTP projects could obstruct views of scenic resources or scenic vistas.

Impact 3.1-2: Construction and implementation of projects in the RTP could potentially alter the appearance of scenic resources along or near designated scenic highways and vista points.

Impact 3.1-3: Construction and implementation of projects included in the 2008 RTP could 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.

Cumulative Impact 3.1-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP influences the pattern of this urbanization, by increasing mobility and including land-use-transportation measures. At the regional scale, the 2008 RTP's contribution to impacts on the overall visual character of the existing landscape setting would be cumulatively considerable.

Impact 3.2-1: Under the Plan, long-term emissions of PM10 and PM2.5 would increase substantially, when compared to existing conditions (2008). PM10 would increase in the SCAB, San Bernardino portion of MDAB and Imperial County portion of SSAB, and PM2.5 emissions would increase in the SCAB; PM10 would increase in Los Angeles, Orange, Riverside and San Bernardino Counties, PM2.5 would increase in Los Angeles and Riverside Counties, as a result of on-road mobile sources. The increase in regional emissions of PM10 and PM2.5 would be considered a significant cumulative impact.

Impact 3.2-3: Emissions of short-term criteria pollutants would increase under the plan as a result of construction of Plan projects and associated development in the region.

Cumulative Impact 3.2-4 Cumulative development would result in on-road emissions discussed in previous impacts as well as train, airplane, ship and stationary and area sources of emissions. All emissions are anticipated to be consistent with applicable AQMPs and SIPs and on-road emissions within regional conformity emission budgets. Nonetheless, such increases in emissions would be significant.

Impact 3.2-5 The 2008 RTP would result in increased trips and VMT as well as increased growth in the region compared to today, resulting in increases in Greenhouse Gas (GHG) emissions.

Impact 3.3-1: Transportation projects included in the 2008 RTP on previously undisturbed land could displace natural vegetation, and thus habitat, some of which is utilized by sensitive species in the SCAG region.

Impact 3.3-2: The 2008 RTP would potentially contribute to the fragmentation of existing habitat, decreasing habitat patch sizes, reducing habitat connectivity, and causing direct injury to wildlife. The 2008 RTP includes new transportation corridors that may form barriers to animal migration or foraging routes.

Impact 3.3-3: The 2008 RTP includes new transportation facilities that could increase near-road human disturbances such as litter, trampling, light pollution and road noise in previously relatively inaccessible and undisturbed natural areas.

Impact 3.3-5: The 2008 RTP projects would potentially create noise, smoke, lights and/or other disturbances to biological resources during construction phases for these projects.

Impact 3.3-6: The 2008 RTP includes projects that would potentially displace riparian or wetland habitat.

Impact 3.3-7: The 2008 RTP would potentially increase siltation of streams and other water resources from exposures of erodible soils during construction activities.

Cumulative Impacts 3.3-9: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization.

Impact 3.4-1: Construction of projects from the 2008 RTP could cause a substantial adverse change in the significance of a historical resource.

Impact 3.4-2: Construction of projects from the 2008 RTP could cause a substantial adverse change in the significance of an archaeological resource.

Impact 3.4-3: Construction of projects from the 2008 RTP could directly or indirectly destroy unique paleontological resources or sites or unique geological features.

Impact 3.4-4: Construction of projects from the 2008 RTP could disturb human remains, including those interred outside of formal cemeteries.

Cumulative Impacts 3.4-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional impacts to existing historic resources and previously undisturbed and undiscovered cultural resources, as described in Impacts 3.4-1 through 3.4-4 above. This impact would be cumulatively considerable.

Impact 3.5-1: The implementation of the 2008 RTP is likely to use electricity, natural gas, gasoline, diesel, and other non-renewable energy types in the construction and expansion of the regional transportation system and development in the region between the current conditions and 2035.

Impact 3.5-2: The implementation of the 2008 RTP is likely to substantially increase the consumption of electricity, natural gas, gasoline, diesel, and other non-renewable energy in the operation of the transportation system and operation of associated growth in the region between the current conditions and 2035.

Impact 3.5-3: Implementation of the 2008 RTP has the potential to not fully address the greenhouse gas reduction levels identified in AB 32 (1990 levels by 2020).

Cumulative Impact 3.5-4: Implementation of the investments and policies in the 2008 RTP would contribute to a cumulatively considerable increase in the amount of total energy consumed in the SCAG region between 2008 and 2035.

Impact 3.6-1: Implementation of the 2008 RTP could expose people or structures to potential substantial adverse effects, risk of surface rupture, ground shaking, liquefaction and landsliding or seismically-induced ground shaking or seiche waves.

Impact 3.6-2: Significant earthwork associated with implementation of the 2008 RTP could result in substantial soil erosion and/or the loss of topsoil in some cases potentially resulting in slope failure.

Impact 3.6-3: Projects included in the 2008 RTP could be located on expansive soils, a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

Cumulative Impact 3.6-4: Urbanization in the SCAG region would increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. Implementation of the 2008 RTP would have the potential to result in a cumulatively considerable adverse effect on human beings when considered at the regional scale.

Impact 3.7-2: The implementation of the 2008 RTP could 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.

Impact 3.7-3: The implementation of the 2008 RTP would create a hazard to the public or the environment by emitting hazardous materials within one-quarter mile of a school.

Cumulative Impact 3.7-5: The 2008 RTP would contribute a cumulatively significant amount of hazardous material transportation impacts to areas outside of the SCAG region.

Impact 3.8-1 The proposed 2008 RTP contains transportation projects and strategies to distribute the future growth in the region. These projects and strategies could result tin inconsistencies with currently applicable adopted local land use plans and policies.

Impact 3.8-2: The 2008 RTP contains transportation projects that have the potential to disrupt or divide established communities.

Cumulative Impact 3.8-3: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to land use and would change the intensity of land use in some areas.

Impact 3.9-1: Grading and construction activities associated with the proposed freeway, arterial, transit and HSRT projects identified in the 2008 RTP would intermittently and temporarily generate noise levels above ambient background levels. Noise levels in the immediate vicinity of the construction sites would increase substantially sometimes for extended duration.

Impact 3.9-2: Noise-sensitive land uses could be exposed to noise in excess of normally acceptable noise levels and/or could experience substantial increases in noise 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 transit facilities as well as increased use of existing transit facilities, etc.).

Cumulative Impact 3.9-3: Cumulative ambient noise levels could increase in urban areas of the region to exceed normally acceptable noise levels or have substantial increases in noise 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 facilities as well as increased use of existing transit facilities, etc.).

Impact 3.10-1: Implementation of the proposed 2008 RTP could result in substantial disturbance and/or loss of prime farmlands and/or grazing lands, throughout the six-county SCAG region.

Impact 3.10-2: Implementation of the projects included in the 2008 RTP would result in a substantial loss or disturbance of existing open space and recreation lands.

Impact 3.10-3 Implementation of the 2008 RTP could increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facilities would occur; or could result in a decrease in performance objectives for existing parks.

Cumulative Impact 3.10-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to open space and result in a loss of open space and agricultural lands in the region.

Impact 3.11-1: Implementation of the 2008 RTP could facilitate substantial population growth to some areas of the region.

Impact 3.11-2: Implementation of the 2008 RTP projects could require the acquisition of rights-of-way that could displace a substantial number of existing homes and businesses.

Cumulative Impact 3.11-3: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to currently vacant natural land.

Cumulative Impact 3.12-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to the staffing level of police and fire and emergency services in the SCAG region.

Cumulative Impact 3.12-6: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to the number of school-age children and the demand for school facilities in different parts of the SCAG region.

Cumulative Impact 3.12-7: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence would create a cumulatively considerable impact to the demand for solid waste services in the SCAG region.

Impact 3.13-1: Implementation of the 2008 RTP could impair transportation safety, security, and reliability for people and goods in the region.

Impact 3.13-2: The RTP has the potential to inhibit the prevention, protection, response to, and recovery from major human-caused or natural events that could create a significant hazard to the public threatening and impacting lives, property, the transportation network and the regional economy.

Cumulative Impact 3.13-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable fire threat to development in the SCAG region.

Impact 3.14-1: In 2035 there would be substantially more total daily Vehicle Miles of Travel (VMT) than the current daily VMT. Implementation of the 2008 RTP would contribute to this increase.

Impact 3.14-2: In 2035 there would be substantially higher average Vehicle Hours Traveled (VHT) in delay than the current condition. Implementation of the 2008 RTP would contribute to this increase.

Impact 3.14-3: In 2035 there would be substantially greater average daily VHT in delay for heavy-duty truck trips than the current condition. Implementation of the 2008 RTP would contribute to this increase.

Cumulative Impact 3.14-7: Implementation of the 2008 RTP would contribute to a cumulatively considerable amount of transportation impacts, such as VMT and all-vehicle VHT in delay, to counties outside of the SCAG region.

Impact 3.15-1: Local surface water quality could be degraded by increased roadway runoff created by RTP projects, potentially violating water quality standards associated with wastewater and stormwater permits. RTP projects could alter the existing drainage patterns in ways that would result in substantial erosion or siltation.

Impact 3.15-2: Increased impervious surfaces due to transportation projects would reduce groundwater infiltration.

Cumulative Impact 3.15-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in impacts to water quality.

Cumulative Impact 3.15-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in impacts to stormwater infiltration and groundwater recharge.

Cumulative Impact 3.15-6: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in flooding hazard impacts.

Cumulative Impact 3.15-7: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the need for increased wastewater treatment capacity in the region by 2035. The proposed Plan influences population growth, resulting in an indirect and cumulative impact on wastewater treatment services.

Cumulative Impact 3.15-8: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to an increased demand for water supply and its associated infrastructure. Water agencies in the SCAG region produce many long-range planning studies to provide a system adequate to supply water demand, however the *existing* water supplies and infrastructure would not be sufficient to meet the expected demand in 2035.

Significant and Irreversible Impacts

CEQA §21100(B) and CEQA Guidelines §15126.2(c) require that an EIR analyze the extent to which the proposed project's primary and secondary effects would impact the environment and commit nonrenewable resources to uses that future generations will not be unable to reverse.

As previously discussed, the project would introduce new land uses across the region, including in to areas that are currently vacant, open space/recreation and agricultural. The 2008 RTP projects and associated growth would use substantial nonrenewable resources, including sand, gravel, and fuel during construction, and energy resources during operation.

Cumulative Impacts

This PEIR analyzes cumulative impacts of the RTP with other plans and anticipated growth in the region. SCAG's Regional Comprehensive Plan (RCP) is currently undergoing substantial updates and is a potential cumulative project to the 2008 RTP. It is not anticipated that the RCP would result in any additional impacts beyond those analyzed in this PEIR.

Cumulative Impact 3.1-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP influences the pattern of this urbanization, by increasing mobility and including land-use-transportation measures. At the regional scale, the 2008 RTP's contribution to impacts on the overall visual character of the existing landscape setting would be cumulatively considerable.

Cumulative Impact 3.2-4: Cumulative development would result in on-road emissions discussed in previous impacts as well as train, airplane, ship and stationary and area sources of emissions. All emissions are anticipated to be consistent with applicable AQMPs and SIPs and within regional conformity emission budgets. Nonetheless, such increases in emissions would be significant.

Cumulative Impact 3.2-5: The 2008 RTP would result in increased trips and VMT as well as increased growth in the region compared to today, resulting in increases in Greenhouse Gas (GHG) emissions.

Cumulative Impacts 3.3-9: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization.

Cumulative Impacts 3.4-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional impacts to existing historic resources and previously undisturbed and undiscovered cultural resources, as described in Impacts 3.4-1 through 3.4-4 above. This impact would be cumulatively considerable.

Cumulative Impact 3.5-4: Implementation of the investments and policies in the 2008 RTP would contribute to a cumulatively considerable increase in the amount of total energy consumed in the SCAG region between 2008 and 2035.

Cumulative Impact 3.6-4: Urbanization in the SCAG region would increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. Implementation of the 2008 RTP would have the potential to result in a cumulatively considerable adverse effect on human beings when considered at the regional scale.

Cumulative Impact 3.7-5: The 2008 RTP would contribute a cumulatively significant amount of hazardous material transportation impacts to areas outside of the SCAG region.

Cumulative Impact 3.7-6: Implementation of the investments and policies in the 2008 RTP could create a potential hazard to the public or the environment by the disturbance of contaminated sites as a result of population and housing growth in the region.

Cumulative Impact 3.8-3: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to land use and would change the intensity of land use in some areas.

Cumulative Impact 3.9-3: Cumulative ambient noise levels could increase in urban areas of the region to exceed normally acceptable noise levels or have substantial increases in noise 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 facilities as well as increased use of existing transit facilities, etc.).

Cumulative Impact 3.10-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to open space and result in a loss of open space and agricultural lands in the region.

Cumulative Impact 3.2-3: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to currently vacant natural land.

Cumulative Impact 3.12-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to the response times of police and fire and emergency services in the SCAG region.

Cumulative Impact 3.12-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable impacts to the staffing level of police and fire and emergency services in the SCAG region.

Cumulative Impact 3.12-6: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence

on growth contributes to regional cumulatively considerable impacts to the number of school-age children and the demand for school facilities in different parts of the SCAG region.

Cumulative Impact 3.12-7: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence would create a cumulatively considerable impact to the demand for solid waste services in the SCAG region.

Cumulative Impact 3.13-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth contributes to regional cumulatively considerable fire threat to development in the SCAG region.

Cumulative Impact 3.14-7: Implementation of the 2008 RTP would contribute to a cumulatively considerable amount of transportation impacts, such as VMT and all-vehicle VHT in delay, to counties outside of the SCAG region.

Cumulative Impact 3.15-4: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in impacts to water quality.

Cumulative Impact 3.15-5: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in impacts to stormwater infiltration and groundwater recharge.

Cumulative Impact 3.15-6: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in flooding hazard impacts.

Cumulative Impact 3.15-7: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by including land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to the need for increased wastewater treatment capacity in the region by 2035. The proposed Plan influences population growth, resulting in an indirect and cumulative impact on wastewater treatment services.

Cumulative Impact 3.15-8: Urbanization in the SCAG region will increase substantially by 2035. The 2008 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2008 RTP's influence on growth would contribute to an increased demand for water supply and its associated infrastructure. Water agencies in the SCAG region produce many long-range planning studies to provide a system adequate to supply water demand, however the *existing* water supplies and infrastructure would not be sufficient to meet the expected demand in 2035.

Growth-Inducing Impacts

Growth inducing impacts are those, often secondary, impacts that result from shifts in population growth or distribution, from fostering economic growth, or remove obstacles to growth such as providing access to an area previously inaccessible to growth.

The Plan would result in a distribution of people, jobs, and households differing from the base year and the No Project Alternative. Changes in policies and investments would shift the population distribution expected in 2035, as a function of changes in mobility and land use decisions.

It is anticipated that the 2008 RTP would result in approximately the same population, employment and households as the No project Alternative, but it is anticipated that the Compass Blueprint land use policies will help to achieve a more compact development pattern. Although, the 2008 RTP with added transportation routes would provide greater access to more of the region than the No Project condition, the land use policies would tend to limit the geographic spread of growth. Nonetheless, in specific areas of the region the 2008 RTP would likely induce growth by providing new and/or improved access (for example the High Desert Corridor). Overall the 2008 RTP would accommodate and facilitate growth in the region.

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CHAPTER 7
Glossary

AASHTO	American Association of State Highway and Transportation Officials – A nonprofit, nonpartisan association representing highway and transportation departments in the 50 states, the District of Columbia and Puerto Rico.
AB	Assembly Bill
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 (CARB) to develop appropriate regulations and establish a mandatory reporting system to track and monitor global warming emissions levels.
AB 169	Assembly Bill 169 – Provides for the sixteen federally recognized tribes in the SCAG region to join the SCAG Joint Powers Authority (JPA) to participate in the Southern California Association of Governments by voting at the SCAG General Assembly.
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.
af	Acre-feet
AJR	Assembly Joint Resolution No. 40 – Introduced on August 23, 2007, the Resolution calls upon the governor to declare a state of emergency in respect to the air quality health crisis in the South Coast Air Quality Basin related to emissions of PM 2.5, and to direct steps necessary to address the emergency.
Antelope Valley AQM	Antelope Valley Air Quality Management District – The air pollution control agency for the portion of Los Angeles County north of the San Gabriel Mountains.
AQMP	Air Quality Management Plan – Regional plan for air quality improvement in compliance with federal and State requirements.
ARB	Air Resources Board – Refer to CARB, California Air Resources Board.
ATMS	Advanced Transportation Management Systems – Technology used to improve the operations of the transportation network.
AVO	Average Vehicle Occupancy – Calculated by dividing the total number of travelers by the total number of vehicles.
ALUC	Airport Land Use Commission
ARPA	Archeological Resources Protection Act
asl	Above Sea Level
BLM	United States Bureau of Land Management
BLS	Bureau of Labor Statistics – The principal fact-finding agency for the federal government in the broad field of labor economics and statistics.
BMP	Best Management Practice
BNSF	Burlington Northern Santa Fe Railroad
BRT	Bus Rapid Transit
Btu	British Thermal Units
BUR	Bob Hope Airport (Also known as Burbank Airport)
CAA	Clean Air Act (CAA) – 1970 federal act that authorized EPA to establish air quality standards to limit levels of pollutants in the air. EPA has promulgated such standards (or NAAQS) for six criteria pollutants: sulfur dioxide (SO2), nitrogen dioxide (NO2), carbon monoxide (CO), ozone,

	lead, and particulate matter (PM10). All areas of the United States must maintain ambient levels of these pollutants below the ceilings established by the NAAQS; any area that does not meet these standards is a "non-attainment" area. States must develop SIPs to explain how they will comply with the CAA. The act was amended in 1977 and again in 1990.
CAFÉ	Corporate Average Fuel Economy
Cal/EPA	California Environmental Protection Agency
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.
CARB	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.
CBSC	California Building Standards Code
CCA	California Coastal Act
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CDMG	California Department of Mines and Geology
CDPR	California Department of Parks and Recreation
CEHD	Community, Economic and Human Development Committee – A SCAG committee that studies the problems, programs and other matters which pertain to the regional issues of community, economic and human development and growth. This committee reviews projects, plans and programs of regional significance for consistency and conformity with applicable regional plans.
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.
CFR	Code of Federal Regulations
CHP	California Highway Patrol
CHRI	California Historic Resources Inventory
CHSRA	California High-Speed Rail Authority – Agency responsible for planning, designing, constructing and operating a state of the art high-speed train system in California.
CIWMB	California Integrated Waste Management Board
CMAQ	Congestion Mitigation and Air Quality Program – Federal program initiated by ISTEA to provide funding for surface transportation and other related projects that contribute to air quality improvements and reduce congestion.
CNEL	Community Noise Equivalent Level
CNSSTC	California-Nevada Super-Speed Train Commission – Public Private Partnership developed to promote a high-speed link between California and Nevada.
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.
COG	Council of Governments – Under State law, a single or multi-county council created by a joint powers agreement.
COMPASS Blueprint/Growth Visioning	A planning process guided by input from the public and initiated by SCAG to develop a regional strategy for addressing future growth in Southern California.
Congestion Pricing	User fee imposed on vehicles during peak demand periods on congested roadways.
Corridor	In planning, a broad geographical band that follows a general directional flow or connects major sources of trips. It may contain a number of streets and highways, and transit lines and routes.
CRA	Colorado River Aqueduct
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.
CWA	Clean Water Act
DHS	Department of Homeland Security

DMA 2000	Disaster Mitigation Act of 2000
DNL	Day-to-Night Average Noise Level
DOD	Department of Defense
DOE	Department of Energy
DTIM	Direct Travel Impact Model – A vehicle emissions forecasting model.
DTSC	Department of Toxic Substances
DWR	California Department of Water Resources manages the State's water supply.
EDF	Environmental Defense Fund – A national nonprofit organization that seeks to protect the environmental rights of all people, including future generations.
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.
EIS	Environmental Impact Statement (federal) – National Environmental Policy Act (NEPA) requirement for assessing the environmental impacts of federal actions that may have a significant impact on the human environment.
EMFAC	Emission Factor – Model that estimates on-road motor vehicle emission rates for current year as well as backcasted and forecasted inventories.
EPA	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.
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.
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 the atates to construct and improve the National Highway System, urban and rural roads, and bridges.
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.
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.
Grade Crossing	A crossing or intersection of highways, railroad tracks, other guideways, or pedestrian walks, or combinations of these at the same level or grade.
HCP	Habitat Conservation Plan – Established under Section 10 of the Endangered Species Act to allow development to proceed while protecting endangered species.
HDT	Heavy Duty Truck – Truck with a gross vehicle weight of 8,500 pounds or more.
Home-based work trips	Trips that go between home and work, either directly or with an intermediate stop. Home-based work trips include telecommuting, working at home and non-motorized transportation work trips.
HOT Lane	High Occupancy Toll Lane – An HOV lane that single-occupant drivers can pay to drive in.
HOV Lane	High Occupancy Vehicle Lane – 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.
HSRT	High-Speed Regional Transport – Transportation system that operates at very high speeds on an exclusive right-of-way.
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.
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.

IID	Imperial Irrigation District
Infrastructure	The basic facilities, equipment, services and installations needed for the growth and functioning of a community.
IOS	Initial Operating Segment.
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.
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.
JPA	Joint Powers Authority – Two or more agencies that enter into a cooperative agreement to jointly wield powers that are common to them. JPAs are a vehicle for the cooperative use of existing governmental powers to finance and provide infrastructure and/or services in a cost-efficient manner.
kWh	Kilowatt Hours
LAA	Los Angeles Aqueduct
LACMTA	Also Metro, Los Angeles County Metropolitan Transportation Authority, more commonly referred to as the MTA – agency responsible for planning and funding countywide transportation improvements, administering the county's transportation sales tax revenues, and operating bus and rail transit service.
LADWP	Los Angeles Department of Water and Power, also DWP, is the largest municipal agency in the country, serving much of the greater Los Angeles region
LAFCO	Local Agency Formation Commission
LAUPT	Los Angeles Union Passenger Terminal, also known as Union Station.
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
LGB	Long Beach Airport
Livable Communities	Communities that are pedestrian and transit-friendly environments, achieved through local government building and design standards and private builders' implementation.
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.
MAGLEV	Magnetic Levitation high-speed transportation system.
maf	Million acre-feet
MAP	Million Annual Passengers – Used to quantify airport activity.
MCL	Maximum Contaminant Level
MDAB	Mojave Desert Air Basin – Area defined by State law as comprising the desert portions of Los Angeles, Kern, Riverside, and San Bernardino Counties.
MDAQMD	Mojave Desert Air Quality Management District – Local air agency mandated by State and federal regulations to implement and enforce air pollution rules and regulations; encompasses the desert portion of San Bernardino County from the summit of the Cajon Pass north to the Inyo County Line, as well as the Palo Verde Valley portion of Riverside County.
mgd	Million gallons a day
Metro	Los Angeles County Metropolitan Transportation Authority
Metrolink	Regional commuter rail system connecting Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties and operated by SCRRA.
Mixed Flow	Traffic movement having autos, trucks, buses and motorcycles sharing traffic lanes.
Model	A mathematical description of a real-life situation that uses data on past and present conditions to make a projection.

MPO	Metropolitan Planning Organization – A federally required planning body responsible for transportation planning and project selection in a region.
MRF	Material Recovery Facility
MS4	Municipal Separate Storm Sewer System
MTBE	Methyl Tertiary Butyl Ether
Multi-Modal	A mixture of the several modes of transportation, such as transit, highways, non-motorized, etc.
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.
NAFTA	North American Free Trade Agreement – An agreement between the governments of Canada, Mexico, and the United States to eliminate barriers to trade and facilitate the cross-border movement of goods and services.
NCP	National Contingency Plan
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.
NEPA	National Environmental Protection Act – Federal environmental law that applies to all projects funded with federal funds or requiring review by a federal agency.
NHPA	National Historic Preservation Act
NIMS	National Incident Management System – Nationwide template that enables all government, private-sector and non-governmental organization to work together during a domestic incident.
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.
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
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.
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.
OES	Office of Emergency Services
OHMS	Office of Hazardous Materials Safety
OLDA	Orangeline Development Authority – Joint exercise of powers authority developed by the cities located along the Orangeline corridor.
ONT	Ontario International Airport
PATH	Partners for Advanced Transit and Highways – Joint venture of Caltrans which includes the University of California, and other public and private academic institutions and industries.
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.
PeMS	Freeway Performance Measurement System – A service provided by the University of California, Berkeley, to collect historical and real-time freeway data from freeways in the State of California in order to compute freeway performance measures.
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.
PRC	Public Resources Code
PUC	Public Utilities Commission – Regulates privately owned telecommunications, electric, natural gas, water, railroad, rail transit, and passenger transportation companies.

PSP	Palm Springs International Airport
RC	Regional Council – Conducts the affairs of SCAG; implements the General Assembly's policy decisions; acts upon policy recommendations from SCAG policy committees and external agencies; appoints committees to study specific problems; and amends, decreases or increases the proposed budget to be reported to the General Assembly.
RCP	Regional Comprehensive Plan (RCP) – 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.
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.
RSPA	Research and Special Programs Administration
RTDM	Regional Transportation Demand Model
RTIP	Regional Transportation Improvement Program – Refers to the share of capital outlay improvement funds controlled by regional agencies (75 percent of STIP funds). (Note: The FTIP is locally referred to as the 2006 RTIP.)
RTP	Regional Transportation Plan (RTP) – 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.
RTPA	Regional Transportation Planning Agency
RTSS	Regional Transit Security Strategy – strategy for the region with specific goals and objectives related to the prevention, detection, response and recovery of transit security issues.
RWQCB	Regional Water Quality Control Boards are 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 − The council of governments and transportation planning agency for San Bernardino County. SANBAG is responsible for cooperative regional planning and developing an efficient multi-modal transportation system county-wide.
SANDAG	San Diego Association of Governments.
SBD	San Bernardino International 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.
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.
SDWA	Safe Drinking Water Act
SED	Socioeconomic Data – Population, employment and housing forecast.
SEL	Sound Exposure Level
SEMS	Standard Emergency Management System
SHA	State Highway Account – The major State transportation account for highway purposes. Revenues include the State excise taxes on gasoline and diesel fuel and truck weight fees.

SHPO	California State Office of Historic Preservation
SIP	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 (also known as JWA)
SOAR	Save Open Space and Agricultural Resources
SOX	Sulfur Oxide – Any of several compounds of sulfur and oxygen, formed from burning fuels such as coal and oil.
SR	State Route
SSAB	Salton Sea Air Basin – Comprises the Coachella Valley portion of Riverside County and all of Imperial County.
STIP	State Transportation Improvement Program – A four-year capital outlay plan that includes the cost and schedule estimates for all transportation projects funded with any amount of State funds. The STIP is approved and adopted by the CTC and is the combined result of the ITIP and the RTIP.
SWFP	Solid Waste Facility Permit
SWP	Sate Water Project
SWQCB	State Water Quality Control Board
TAC	Technical Advisory Committee – A SCAG committee that provides ideas and feedback on the technical integrity of the Regional Transportation Plan.
taf	Thousand acre feet
TAZ	Traffic Analysis Zone – Zone system used in travel demand forecasting.
TCC	Transportation and Communications Committee (SCAG) – Committee used to study problems, programs and other matters related to regional issues of mobility, air quality, transportation control measures and communications.
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.
TCRP	Traffic Congestion Relief Program – Enacted by State legislation in 2000 to provide additional funding for transportation over a six-year period (later extended to eight years). The program is funded by a combination of General Fund revenues (one-time) and ongoing revenues from the State sales tax on gasoline. In March 2002 voters passed Proposition 42, which permanently dedicated gasoline sales tax revenues to transportation purposes.
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.
TMC	Transportation Management Center
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.
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.
TSA	Transportation Security Administration
TSDF	Treatment, Security and Disposal Facility
TUMF	Transportation Uniform Mitigation Fee – Ordinance enacted by the Riverside County Board of Supervisors and cities to impose a fee on new development to fund related transportation improvements.
UBC	Uniform Building Code

UP	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
US DOT	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. US DOT is comprised of ten operating administrations, including FHWA, FTA, FAA, and FRA.
USFS	United States Forest Service
USFWS	Unites States Fish and Wildlife Service
USGS	United States Geological Survey
VCTC	Ventura County Transportation Commission – Agency responsible for planning and funding county-wide transportation improvements.
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.
VHDD	Vehicle Hours of Daily Delay – Hours of delay attributed with congestion for vehicles each day.
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.
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.
WDR	Water Discharge Requirement

CHAPTER 8

Maps